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Dental Digest

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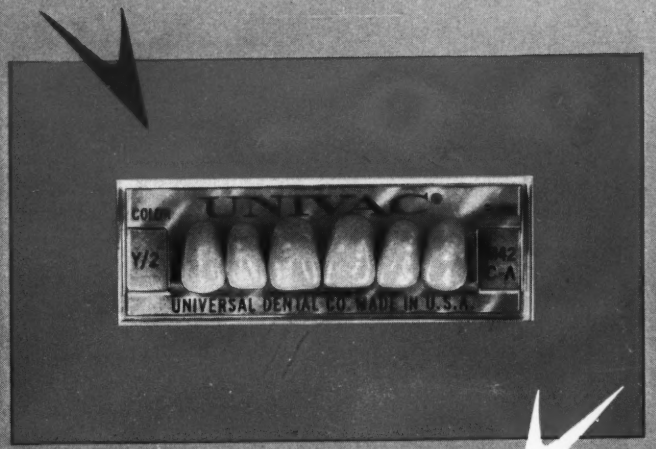

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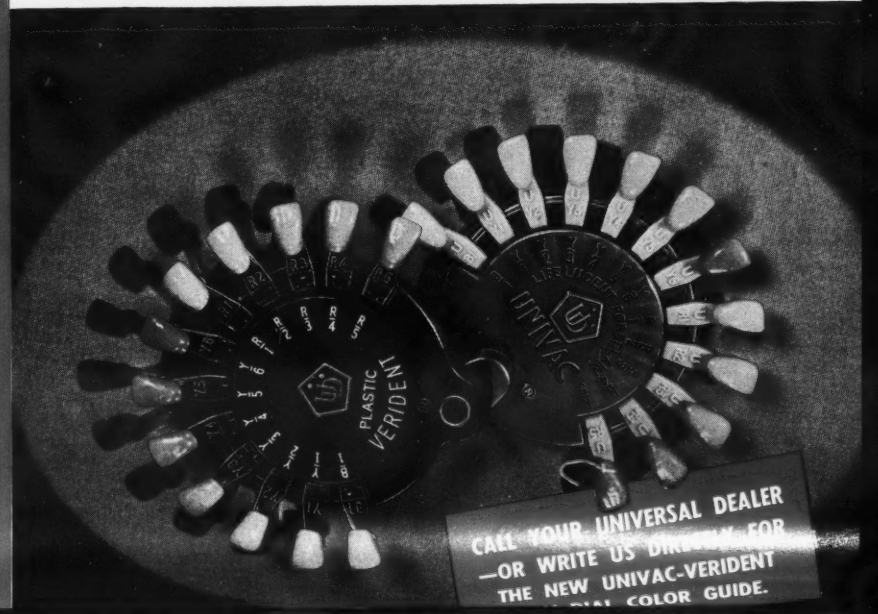

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INLAY PRODUCTION

from Rubber-based Impressions

A. KINGHORN, L.D.S., D.D.S., and D.N. ALLAN, M.D.S., D.D.S.

DIGEST

The procedure described in this article is a complete clinical technique employing injection of rubber-based impression material which has been evolved and used in the Conservation Department of the Newcastle upon Tyne Dental Hospital during the past two years. As with the hydrocolloids, a hard stone plaster is used as a die material. With reasonable care in the carving of the wax patterns the adequacy of stone as a die material has been well proved in years of use.

Approved Techniques

The direct wax pattern is favored as the additional stages of any indirect technique increase the risk of inaccuracy. Although the direct method may be ideal in theory the following factors may contribute to its limitation in practice:

1. Inaccessible cavities (especially in the posterior of the mouth)
2. Large patterns (particularly those which become loose when carving)
3. The physical and psychologic characteristics of some patients

Accepted Indirect Technique—The copper band and compound technique has for many years been the accepted indirect method. The problem of distortion, however, may be encountered as a certain overlap of all cavity margins is essential to produce a complete impression. When this overlap is beyond the greatest convexity of the tooth an undercut will be engaged on the outer surface of the tooth. As the impression is withdrawn from the tooth some distortion of the compound adjacent to these margins is bound to occur.

Variation in Results Confirmed—The existence of inaccuracies is easily confirmed when two inlays are made from two separate impressions from the tooth itself and it is found that they are not interchangeable on the dies. They will fit the tooth with varying inaccuracies.

Advantages of the Rubber-based Impression

An impression material which (1) will not suffer permanent distortion from undercuts either natural, outside the cavity, or unintended within the cavity, and (2) which is elastic and capable of fully recovering its shape is required.

Hydrocolloid Introduced—In 1937 Sears[1] introduced reversible hydrocolloid to the field of indirect inlays which had the following advantages:

1. This elastic material would reproduce without distortion all undercuts.
2. With the use of stone dies it was possible to produce inlays of far greater accuracy than had been available by any previous indirect method.
3. For the first time inlays made on one model could be transferred to another made from a separate impression of the mouth.
4. Without extra effort several preparations could be dealt with in the one impression.
5. Correct contacts and an accurate occlusion could be produced in the laboratory with a precision unknown before.

Disadvantages of Hydrocolloid Material—(1) The apparatus required for convenient preparation and use was bulky and expensive, and (2) a marked tendency existed to syneresis and imbibition of the material so that the casting of the impression could not be delayed without the risk of dimensional changes.

New Elastic Impression Material

In the past two and a half years a synthetic "rubber" base material has been made available. The material has the following excellent qualities:

1. It has the accuracy of reversible hydrocolloid and it is much tougher.
2. Because it is dimensionally stable, the material may be stored without casting immediately.
3. The minimum of special apparatus is required for its use.

Composition—The main constituent of the impression paste, known commercially as "Thiokol", was discovered by Patrick in the U.S.A. in 1932 during research for a new antifreeze liquid. Although referred to as a "rubber", chemically the material lies somewhere between a resin and a synthetic rubber. Unlike natural rubber, Thiokol has a high resistance to decomposition by petrol and oil and is also resistant to the action of water, sunlight, and oxygen.

Final Consistency—For use as a dental impression paste the material is presented in two tubes: (1) the first tube contains the Thiokol together with zinc oxide and calcium sulphate. (2) In the second tube is the accelera-

[1]Sears, A. W.: Hydrocolloid Impression Technique for Inlays and Fixed Bridges, DENTAL DIGEST **43**:226 (May) 1937.

tor, which is usually lead peroxide, with a trace of sulphur and some castor oil as a vehicle.

When mixed together the Thiokol is polymerized to a final consistency similar to that of India rubber.

Technique

Ready acceptance for inlay production has awaited a satisfactory technique. The use of a copper ring with rubber base has many disadvantages: (1) confining the material which is then not free to negotiate undercuts on withdrawal. (2) The contact points and occlusion are no more accurately reproduced than with the previous copper band and compound technique. (3) Use in a full tray meets with difficulty through the entrapping of air in the cavities.

A method of injection similar to that employed for reversible hydrocolloid is therefore required for a full-tray impression.

Taking the Impression

The advantages of taking the impression in a complete tray over the copper band technique are the following:

(a) A greater bulk of material than can be contained in a copper band is free to spring past the bulbous contours of the tooth and to recover its form.

(b) With a model which is initially cast in one piece there is no problem of location of a die in an overall impression and so contact points and occlusion are accurately reproduced.

(c) Multiple preparations can be dealt with in one impression with little extra effort. The advantages of a one-piece impression for bridge construction are obvious.

Full Tray Preferred—The full tray is preferable to a half or side tray because of greater stability in the mouth when taking the impression, and also the resulting full model is more accurately articulated with a model of the opposing jaw. In simple cases when using full models there is often no need to mount the case on an articulator. When articulation is indicated it may be worth while to take a face-bow recording and to mount the case on an anatomic articulator.

Composition Lining Advocated—A compound impression is taken which involves little more than the crowns of the teeth and this is progressively removed while still plastic. A box is cut in the compound which will allow one-eighth of an inch of rubber material to surround the prepared teeth. The compound lining is advocated for the following reasons:

(a) Economy in the amount of impression paste used.

(b) Restricting the thickness of material, which surrounds the prepared teeth, to about one-eighth of an inch. (Skinner and Cooper have stated that in thicknesses greater than three-sixteenths of an inch the material is liable to distortion.)

(c) Acting as an occlusal stop or rest on the remaining teeth and so preventing movement and compression of the setting material.

Retention of Rubber to Compound—When chilled, the prepared tray should return to place in the mouth without difficulty. The box and the tooth-bearing area of the compound are coated with a rubber adhesive solution supplied only with certain brands of the materials, but which is considered essential for the proper retention of the rubber to the compound.

Packs Used—The soft impression paste will not push back any gingival tissue which overlies the cavity. As with the reversible hydrocolloids, it is necessary to insert packs to retract the gingival tissue and so form a crevice into which the impression paste will flow.

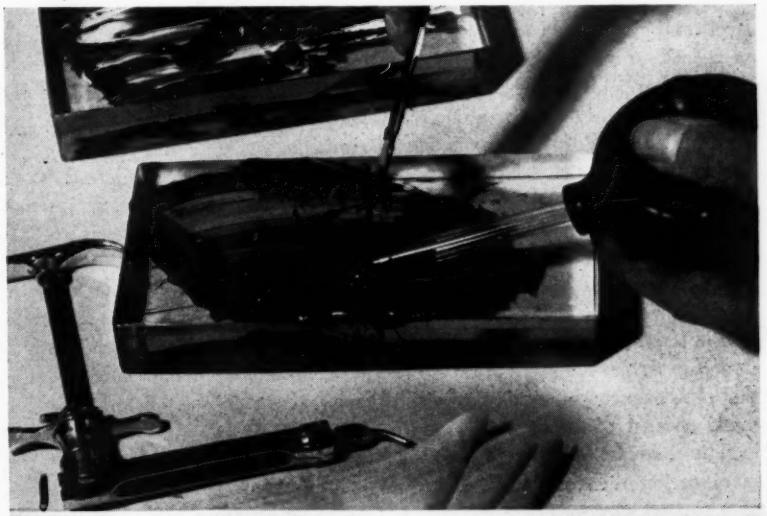
Method—Packs may be prepared from wisps of cotton-wool rolled between finger and thumb. These can be varied in size as required and the pressure effect which temporarily alters the contour of the soft tissue can be enhanced and prolonged by the addition of an astringent, such as 7 per cent zinc chloride solution. The packs should be left in position for three to four minutes while the tray is being prepared.

Mixing the Material

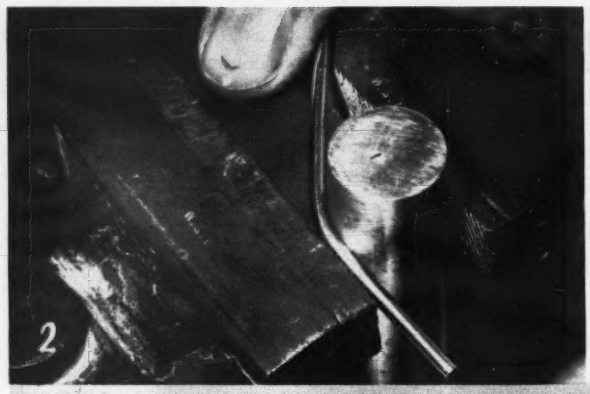
1. A sufficient quantity of material from the two tubes is proportioned on to a glass slab according to the directions of the manufacturers.

2. A dental cement spatula is too small to mix the quantity of paste required; a powder spatula with a blade four inches long by three-quarters of an inch wide will be found to be more effective. These spatulas may be obtained from a medical supply house.

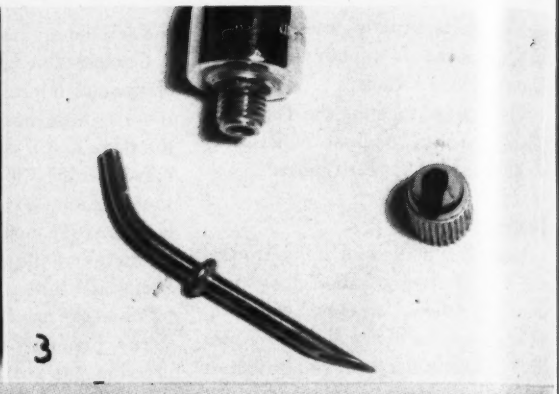
3. The white base material adheres most persistently to the slab and spatula, making it difficult to avoid a streaky mix.



1. ***The combined action of the spatula and suction from the chip syringe bulb used to fill the glass cartridge.***



2. *A ⅝-inch former and the stainless steel tubing held lightly in a vise to make the bend of the "needle."*



3. *A complete "needle" with the syringe and nozzle bored out. The nozzle has been further modified with a slot to accommodate the bend in the needle.*

4. A homogenous mix can be achieved by transferring the partly mixed paste to a second slab and completing the mix in a total time of forty-five seconds with a second clean spatula.

Use of the Syringe

The syringe used for the injection of the cavities is of the normal cartridge type. The only modifications needed are the reaming of the nozzle and hub to take a large-bore needle. The needle is made from stainless steel orthodontic tubing of 1¼-millimeter bore, and is preferably bent to a suitable angle (Fig. 1).

Bend Obtained in the Needle—This is done by pulling a length of stainless steel tubing round a rod of metal approximately five-eighths of an inch in diameter, the tubing and rod being lightly held in a vise (Fig. 2). The needle is retained in the syringe when the nozzle is in place by a ring of 1-millimeter wire soldered round the needle, and is sharpened at one end to penetrate the soft rubber diaphragm of the cartridge tube. A small hole can be made with a rubber dam punch in the diaphragm to assist the penetration. The needle should not be so long that the point can be damaged by the metal plunger of the syringe when it is fully depressed. Figure 3 shows a modification of the nozzle in the form of a slot which allows the curvature of the needle to pass through it when the syringe is assembled.

Loading the Syringe—The rubber mix is drawn into a clean and dry cartridge tube by the suction of a chip syringe bulb. A half-filled tube is sufficient for the normal case: (1) The soldid rubber plunger is inserted into the end of the tube containing the paste, and (2) the rubber diaphragm into the unfilled end of the tube. With this method, when the tube is placed in the syringe, the needle can be seen to have penetrated the rubber diaphragm. If the lumen of the needle is clear the material will flow freely.

Insertion of the Material

The following steps are taken:

1. While the assistant is preparing the syringe, the operator should remove all the gingival packs. Although it is unnecessary for the cavities to be entirely dry there should be no free moisture present.

2. The cavities are injected, starting in the deepest and most inaccessible corners and progressively covering each margin.

3. In the meantime, the assistant uses the remainder of the mix to load the tray by filling the cut-out arch in the compound. This will give an accurate and complete impression of all the teeth.

4. When the tray is placed in the mouth care must be taken to keep saliva away from the paste already injected into the cavities, otherwise the two masses of paste will not unite.

5. According to the brand of material being used sufficient time is allowed for it to set before removing the impression from the mouth. When the impression is removed it should be carefully checked and if necessary it may be washed with water.

6. Should it be necesary to delay the pouring of the model no dimensional change of practical importance has been shown to arise even after several hours.

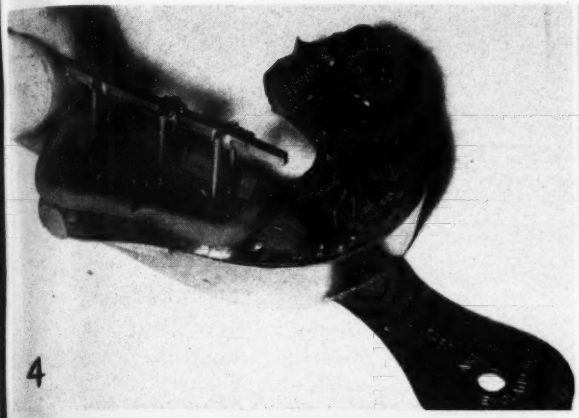
Impression Taken of Opposing Jaw—It only remains to take an accurate impression of the opposing jaw and to insert temporary restorations before dismissing the patient.

Cleaning the Syringe—No attempt should be made to clean the syringe until the material has been given time to set completely: (1) the excess material projecting from the needle is pulled when it will be found to break near the bend, (2) with careful removal of the cartridge the rubber remaining in the needle will be withdrawn with it.

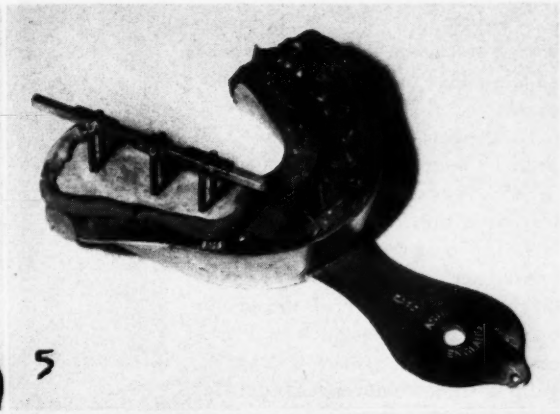
Preparation of Models

The laboratory procedures for making the inlays are carried out on a stone model which is so constructed that individual dies of each prepared tooth can be removed from the main model. Only in this way is proper carving of all margins possible, especially at the gingival edge.

Two methods are described for the preparation of the model. One re-



4. *The jig with pins in position is held in place and after any necessary adjustment a mark is made on the Plasticine surround.*



5. *The jig is lowered into place as soon as the stone is set sufficiently to bear its weight. The position has been guided by the marks on the surround.*

quires the use of a small jig, which is preferable for ease of working, the second does not require special apparatus.

First Method, Location by Pins—Individual dies of each prepared tooth are located to the main model by pins. It is the function of the jig to hold the pins parallel and in their correct location. The jig is constructed from square rod and sleeving obtainable from the dental supply houses. Small segments of the sleeving have half-inch lengths of stainless steel orthodontic tubing of 1 millimeter-bore soldered to them at right angles. The projections of the sleeving segments are bent so as to make them a frictional fit on a short length of the square rod and are alternated so as to enable the tubes to be placed closer together if necessary (Fig. 4). The following steps are taken:

1. An area slightly larger than that of the prepared teeth is walled off with Plasticine in order to confine the stone for the first pouring (Fig. 4).

2. The pin-carrying segments of the jig are adjusted to be within each prepared tooth, and marks made on the Plasticine will locate the jig after pouring the stone.

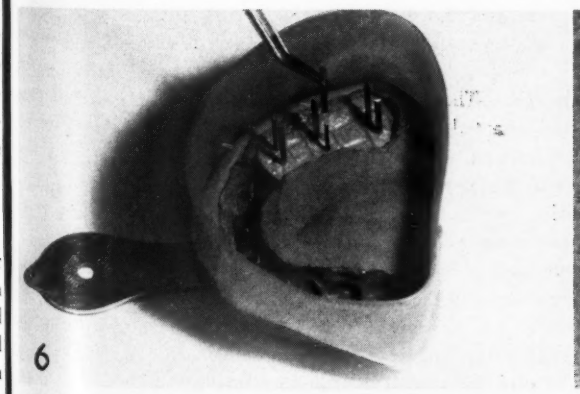
3. In order to produce dies of maximum hardness it is important that the stone be correctly proportioned according to the instructions of the manufacturer. The mixed stone requires heavy vibration to make it flow.

4. Small quantities should be added to the impression and guided over the surface with a piece of blunt wire so as to avoid the trapping of air bubbles.

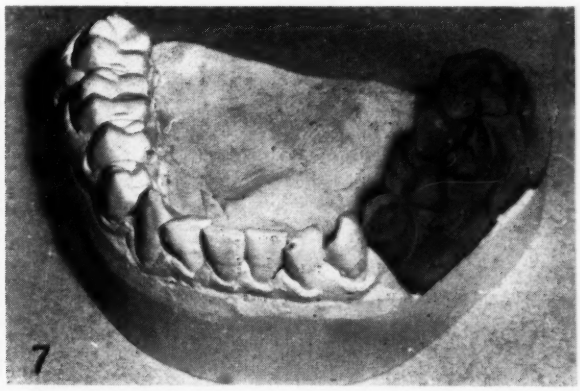
5. When the setting stone is able to bear the weight of the jig it is positioned according to the prearranged marks (Fig. 5).

6. When the stone is completely set the jig is removed, leaving the pins firmly attached in the model.

7. The surface of the stone is



6. *The surface of the first pouring of plaster has been scored and lubricated and a sleeve is being set over one of the pins. The center portion of this lower impression has been obliterated with Plasticine, which has also been used in a thin roll to retain the pink wax boxing.*



7. *The model, after removal of the compound and rubber base impression material. The tooth-bearing area, on its pins, can now be removed from the main model for division of the dies.*

scored and lubricated and sleeves of stainless steel tubing are set over the pins.

8. The complete impression, which is to be poured in plaster, is boxed in with pink wax fastened to the tray by a thin roll of Plasticine.

9. The center portion of a lower impression corresponding to the tongue and the floor of the mouth may also be obliterated with Plasticine (Fig. 6).

Impression Removed: After stripping off the boxing the composition is softened in warm water and the impression materials are carefully removed from the cast (Fig. 7). The prepared tooth-bearing segment is removed while the main model is trimmed.

Tooth Dies Separated: Saw cuts are made to divide the tooth dies from one another. This is most conveniently done with a fret-saw, the frame of which is held in a vise. The cut should begin at the base of the tooth-bearing segment and should be aimed at the gingival interspace, being stopped short of the last one-sixteenth of an inch. This last portion of stone is broken apart.

Risk Reduced: Although this may seem hazardous it does in fact reduce the risk of damage to the gingival edge of the preparation by the saw blade. The fracture always runs through the gingival crevice which is the weakest section of the stone.

Excess Stone Trimmed—It is now necessary to trim all the excess stone away beyond the cervical margin of the die so that no false ledge remains which may confuse the carving and burnishing of the wax pattern (Fig. 8).

Second Method, Location by Grooves—The alternative method of model production is not entirely practicable with a full impression:

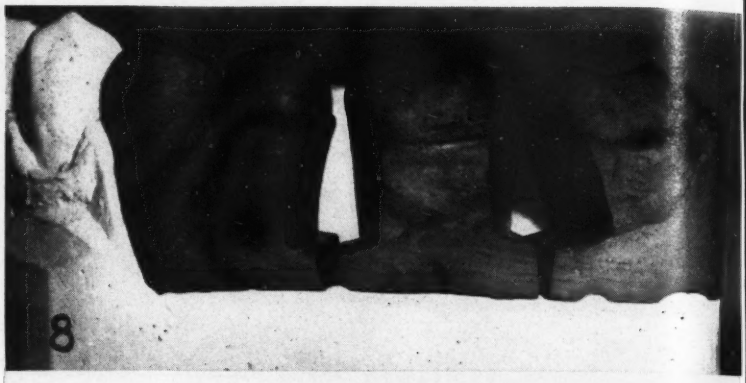
1. The partial impression is cast in stone.

2. The base of the resulting model is trimmed to a taper and vertical grooves are cut in its sides.

3. Following lubrication of these surfaces it is deeply set into a base of plaster and allowed to set.

4. On removal from the plaster base the dies are sawn apart and trimmed as previously described.

5. When returned to the plaster base the dies will be held in correct location to one another.



***8.** Each die has been divided and all waste plaster which might interfere with carving of the wax has been trimmed. The dies seat precisely and firmly to the base, each with the retention of two pins.*

Preparation of Wax Dies

Although it is preferable to line the cavities in the mouth, it is possible to take the impressions, even with undercuts in the dentine and to place the linings in the dies at this stage.

Lubrication—The dry tooth-die is immersed for about one hour in thin oil, when it will be adequately lubricated to prevent the wax pattern from adhering to the stone. The excess oil is drained away on paper towel for a few hours and the dies are then ready for the preparation of the wax patterns.

Wax Adapted to Die—The inlay wax is softened and adapted to the die by firm finger pressure.

Warm Instrument Employed—A warm blunt burnisher, preferably of the beaver tail type, is used for the carving of the pattern. It should be maintained at a heat that will soften but not melt the wax.

Margins Intact—This type of instrument will not involve the risk of damage to the margins of the die that might occur with a sharp carver. The massaging action of the burnisher also ensures perfect adaptation of the wax to the cavity margins.

Wax Polished—The surface of the wax is finally polished with a warm damp pledget of cotton-wool.

Adjustment Seldom Required—After casting, the inlays are trimmed and polished. They are then checked on the models for occlusion and contact. It is found that when the inlays are tried in the mouth they seldom require adjustment and much chair time is saved.

Conclusion

Although in the past there has been a strong emphasis on the direct method for inlay production it is believed that with the introduction of the rubber-based impression materials there is an indication for more inlays to be produced indirectly. Not only will this be easier, but in many cases superior results will be obtained.

Adapted from Original Communications, *British Dental Journal* **103**: 1 (*July* 2) 1957.

Acknowledgements: The authors appreciate the efforts of the many colleagues and students who have freely used this method, thus making it possible to overcome early difficulties and to advocate this technique confidently. E. Brown, L.D.S. has promoted the method and has made many valuable suggestions. The Photographic Department of the Newcastle upon Tyne Dental Hospital prepared the photographs for this article.

JET INJECTION

Local Anesthesia in Dentistry

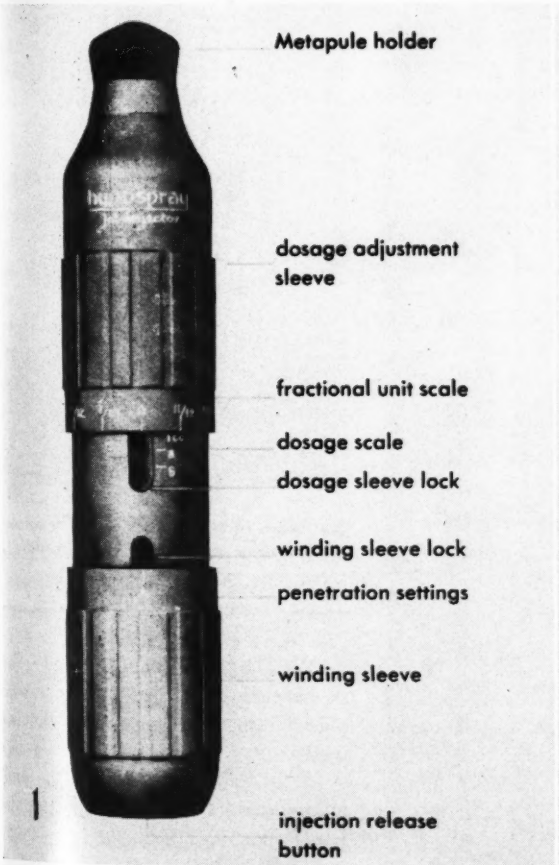
PETER M. MARGETIS, Lieutenant Colonel (DC) USA;
EDWARD P. QUARANTILLO, Lieutenant Colonel (DC) USA;
and ROBERT B. LINDBERG, Lieutenant Colonel (MSC) USA

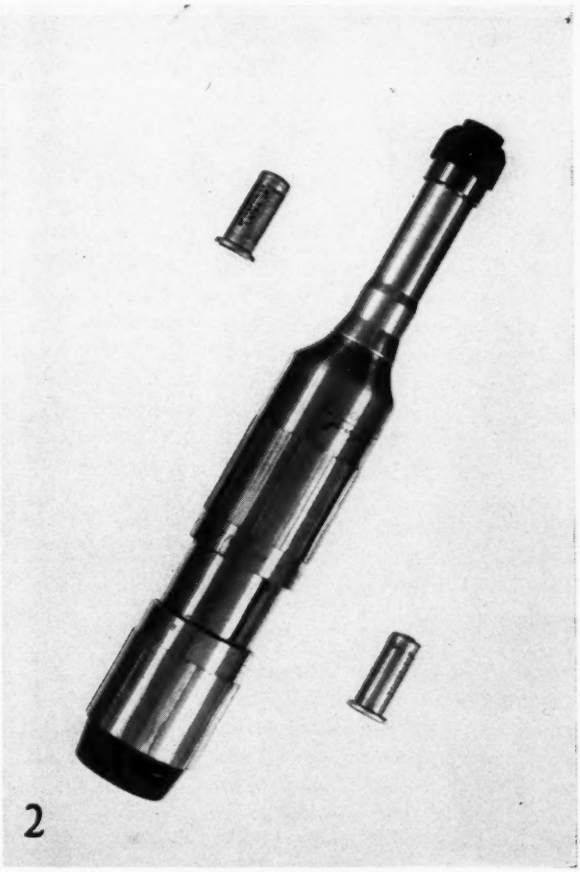
DIGEST

Although the administration of drugs and local anesthetics by means of jet injection in many areas of the body has been reported in the literature,[1-6] there has been until now no report of its use in dentistry. The object of the investigation reported here was to determine the feasibility of producing local anesthesia of sufficient depth and duration, utilizing the jet injection principle, to allow the completion of such routine dental procedures as cavity preparation and the extraction of teeth.

Description

Jet injection is the term given to the principle of injecting fluids into the skin and mucous membranes by forcing liquid substances through extremely small openings or jets at high pressure. The velocity, depth of penetration, and spread depend on (1) the size of the orifice, (2) spring pressure, and (3) type of fluid as well as the type and location of tissue being injected.[1] One of the unique features of





1. *Jet injector for subcutaneous and intramuscular infection of medications and biologicals.*

2. *Jet injector modified for dental use.*

this method is the ability of the column of liquid, traveling at speeds of approximately 700 feet per second, to pierce the tissues without eliciting a pain response, or at the most, causing only slight pain.

Successful Use Reported

1. In 1947 Hingson and Hughes,[1] using jet injection, reported the administration of 0.25 milliliter of 2 per cent procaine with 1:25,000 epinephrine at a pressure of 3,500 pounds per square inch (p. s. i.), to anesthetize the skin of patients preparatory to performing either caudal or spinal analgesia.

2. In 1951 Krohn, Spriggs, and Dabbs[2] injected 29 male patients undergoing anal surgery with 0.25 milliliter of 4 per cent Xylocaine® (brand of lidocaine hydrochloride) in almond oil. Sites of injection were inspected daily throughout their hospital stay and at three weeks after discharge from the hospital. There was no evidence of edema, erythema, induration, abscess, or sloughing. It was shown that these 29 patients exhibited much less postoperative discomfort than a comparable control group.

3. Hingson[3] reported that on a basis of 5,000 patients inadvertent intravenous injection did not seem as likely with jet injection as it was with the needle and syringe method. Further, he was convinced, by both clinical and histologic study of tissue, that there was less trauma with jet injection than with the needle and syringe.

Methods

The injectors used were single-shot, hand-operated, spring-loaded instruments for parenteral injection of medications in calibrated volumes of 1 milliliter or less.* They are 21 centimeters in length and 4 centimeters in diameter. The jet injector is an interconnected, two-part mechanism, the front part containing the metal ampule of material to be injected (Metapule®), and the back part, the power source (Fig. 1). The only modification of the above instrument for this work was to extend the tip to a length of 2 inches (Fig. 2).

Source of Power — The power source is a spring-activated plunger. On the power stroke, the plunger contacts the stopper at the rear of the Metapule with sufficient force to drive the solution ahead of the stopper through the orifice of the Metapule.

Springs Energized by Compression —The injector contains six springs which are energized by compression through a screw and nut principle (Fig. 3). The instantaneous release of the spring energy is accomplished by depressing a latch release button.

Dispersion of Solution Over Large Surface—By reason of high spring pressure and small plunger diameter an instantaneous pressure of 16,000 p. s. i. is developed within the Metapule. As the fluid is expressed from the Metapule, the pressure drops to approximately 7,000 p. s. i. and then tapers off to 3,000 p. s. i. at the end of the shot as the springs expand and lose energy.** Due to the nature of the tissue and the secondary pressures of 7,000 p.s.i., and 3,000 p. s. i., the solution is deposited in several layers around the initial channel rather than in a pool as a needle would do, thereby creating a larger surface for greater dispersion of the solution.

Solution Maintained Under Aseptic Condition—The solution contained in the Metapule is hermetically sealed in an aluminum container under aseptic conditions (Fig. 4). The Metapule has in its conical end a minute orifice through which the jet of liquid is expressed (Fig. 5).

Preparations for Use—(1) The injector is made ready for injecting by pressurizing the springs through the turning of a winding sleeve (Fig. 1).

Acknowledgement: The authors wish to thank Robert P. Scherer and Anthony Venditty for their technical advice.

*The injectors used in these tests were made available on a loan basis by R. P. Scherer Corp., Detroit, Michigan

**Personal Communication, A. Venditty, R. P. Scherer Corp., Detroit, Michigan.

[1]Hingson, R. A., and Hughes, J. G.: Clinical Studies with Jet Injections; New Method of Drug Administration, Anesth. & Analg. **26**:225-230 (Nov.-Dec.) 1947.

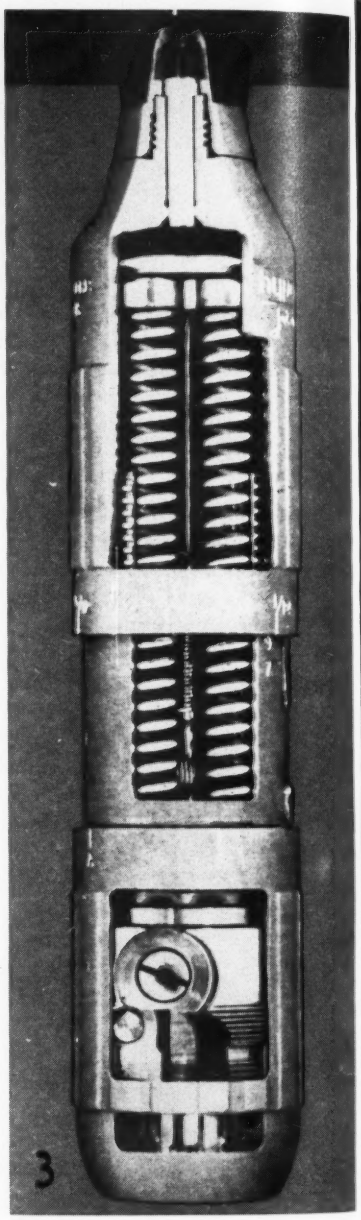
[2]Krohn, S.; Spriggs, J. B.; and Dabbs, C. H.: New Method of Postoperative Anorectal Analgesia, Am. J. Surg. **82**:275-277 (Aug.) 1951.

[3]Hingson, R. A.: Development of Hypospray for Parenteral Therapy by Jet Injection, Anesthesiology **10**:66-75 (Jan.) 1949.

[4]Hirsch, L. L.: Administration of Penicillin and Streptomycin by Hypospray, J. Lab. & Clin. Med. 33:805, 1948.

[5]Hingson, R. A.: Hypospray Administration of Penicillin in Treatment of Gonorrhea, J. Ven. Dis. Inform. **29**:61-63 (March) 1948.

[6]Hughes, J. G.; Jordan, R. G.; and Hill, F. S.: Jet Injection Pediatric Practice, Pediatrics **3**:801-811 (June) 1949.



3. ***Cross section of jet injector showing plunger (top), springs (middle), screw and nut (bottom).***

(2) The Metapule is removed from its hermetically sealed container and placed into the front end of the injector.

(3) A cap is screwed on the end of the injector to hold the Metapule in place.

(4) The correct dosage is selected by use of the rotating dosage scale and the injection is then ready for use.

Preparation of Site for Injection—As it is not necessary to touch the sterile Metapule during its removal from the container and placement into the injector it is only necessary to observe the usual technique of preparing the site for injection, as is done when using a needle and syringe.

Preliminary Test Of Method

Because the only injections into mucous membrane previously reported had been in the anal region,[3] it was decided to make test injections into the peritoneal and oral tissues of rabbits to determine the resistance or nonresistance of those tissues to laceration. It was shown that the tissues were resistant to laceration.

Depth of Penetration Determined—To determine the depth of penetration by the column of liquid, methylene blue was added to 0.1 normal saline solution and the series of injections repeated. The animals were killed and examined immediately after the injection and it was found that the depth of penetration was several millimeters.

Successful Dental Anesthesia Expected — This was considered sufficiently deep to justify the expectation of successful anesthesia in dental use in man.

Study Undertaken

In all, 66 patients ranging in age from 10 to 37 years were used for this study. Usually only one injection was made per appointment but a number of patients had as many as four injections.

Types of Injections—(1) Infiltration, (2) conduction, and (3) block anesthesia were successfully administered.

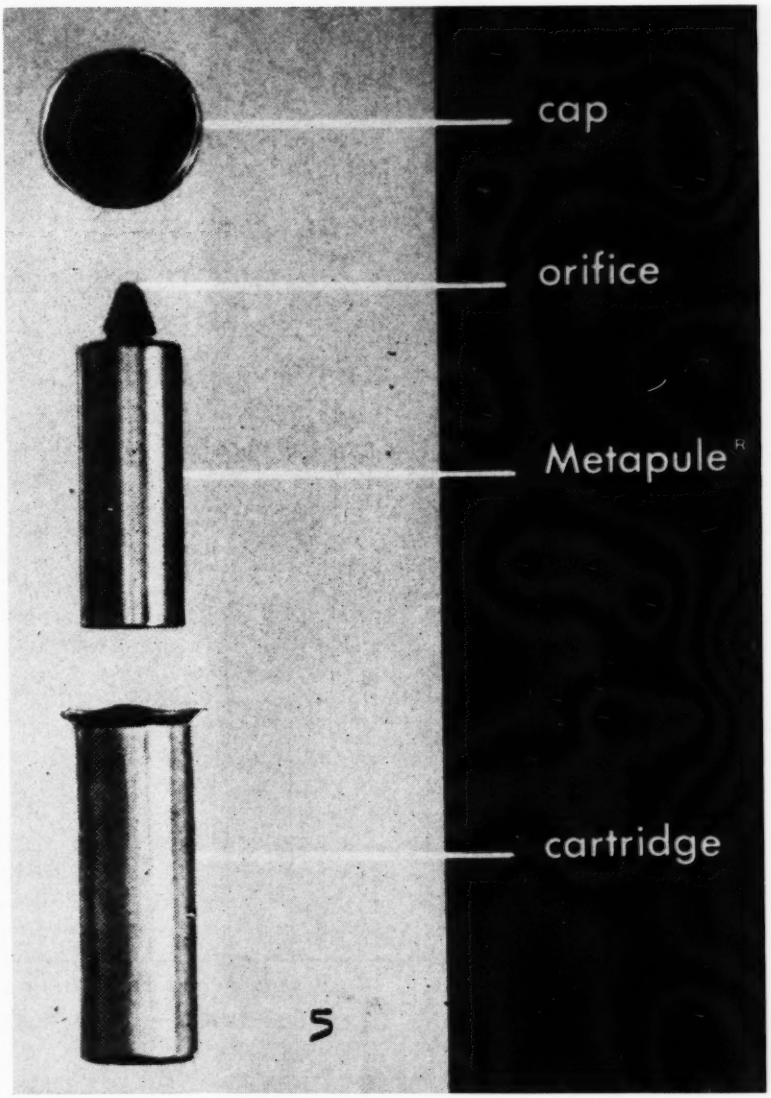
Maxillary Second and Third Molars: These were anesthetized by conduction anesthesia.

Maxillary Centrals Through the First Molar: Infiltration anesthesia was used.

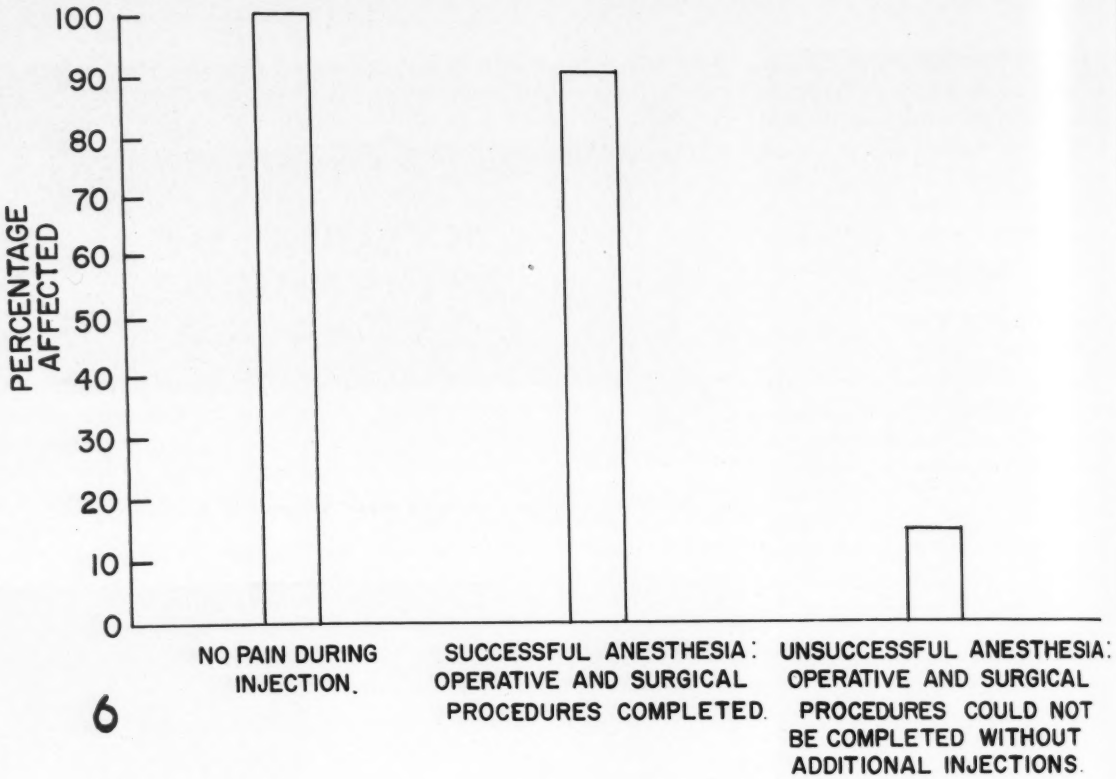
Mandibular Teeth: Anesthetized by use of the intraoral mandibular block and the mental foramen injection as well as the long buccal injection.

Operative Procedures—The remov-

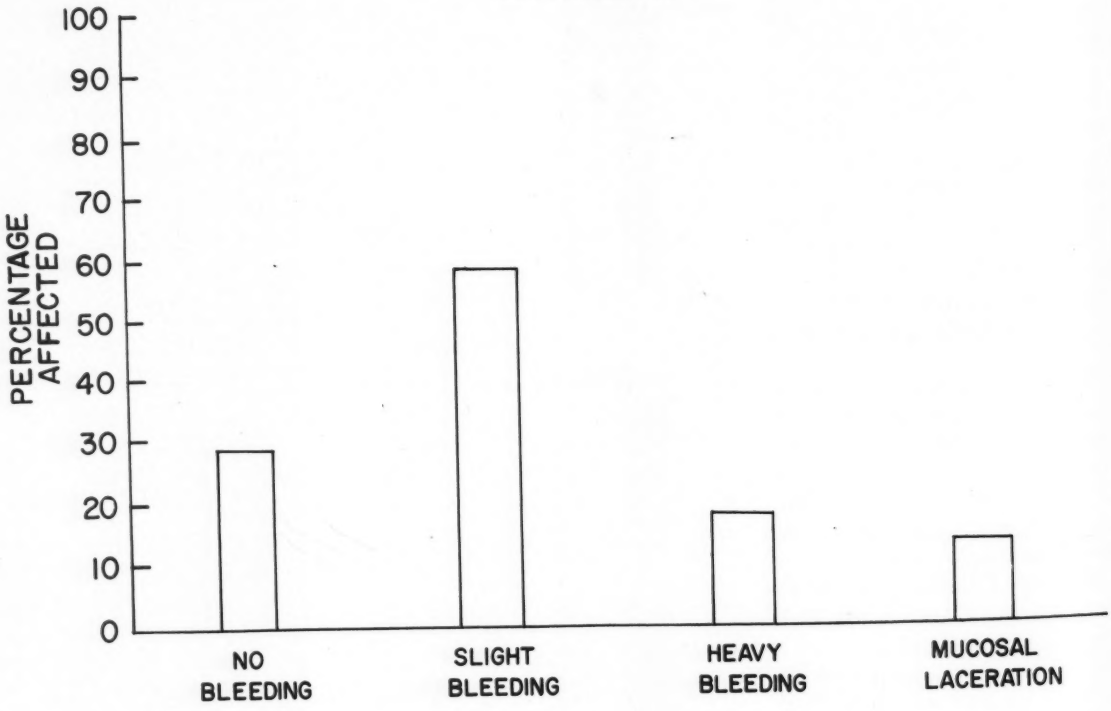
4. ***Aluminum cartridge containing sterile Metapule of Xylocaine.***



5. ***Exploded Metapule showing component parts.***


PERCENTAGE AFFECTED
100
90
80
70
60
50
40
30
20
10
0
NO PAIN DURING INJECTION.
SUCCESSFUL ANESTHESIA: OPERATIVE AND SURGICAL PROCEDURES COMPLETED.
UNSUCCESSFUL ANESTHESIA: OPERATIVE AND SURGICAL PROCEDURES COULD NOT BE COMPLETED WITHOUT ADDITIONAL INJECTIONS.
PATIENT REACTION
(66 PATIENTS)

6


PERCENTAGE AFFECTED
100
90
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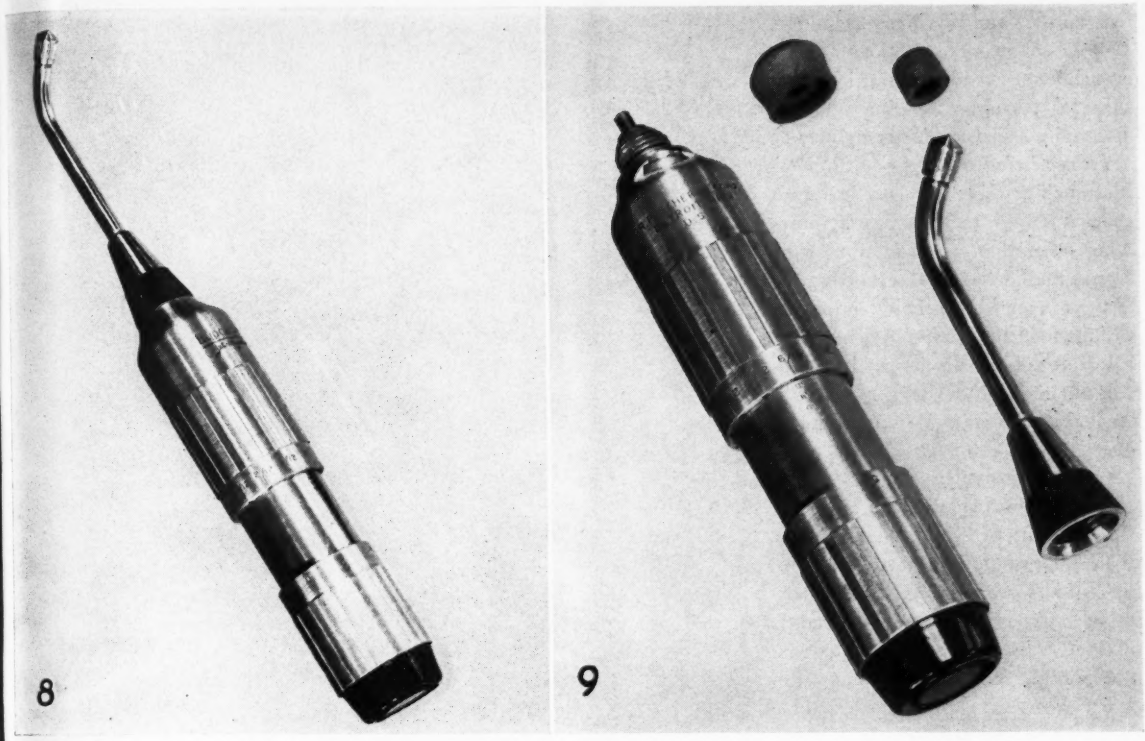
NO BLEEDING
SLIGHT BLEEDING
HEAVY BLEEDING
MUCOSAL LACERATION
PATIENT REACTION
(66 PATIENTS)

7



8. *Jet injector with dental tip in place.*

9. *Jet injector with dental tip removed.*

al of caries and cavity preparation of all classes in both anterior and posterior teeth in both arches was successfully accomplished.

Surgical Procedures — The extraction of anterior and posterior teeth in both arches was successfully completed.

Injection Technique — The technique of making the injection did not differ greatly from the established techniques using a needle. The same "puncture sites" were used, care being taken that the column of liquid entered at right angles to the area that was being injected. Any angle less than 90° resulted in a tendency for the column of liquid to make a small clean incision.

Mechanical Problem: There was difficulty in administering some of the injections due to the mechanical problem of properly placing the injector tip in the limted space of the oral cavity.

Orifice Sizes: These varied from 0.005 to 0.008 inch.

Amount of Solution: 0.6 milliliter per injection was used, although successful injections were made using 0.3 milliliter.

Anesthetic Used: 2 per cent Xylocaine® with epinephrine 1:100,000 and 1:50,000. The instrument was disinfected by removing the tip, washing it with soap and hot water, then placing it in benzalkonium chloride.

Results and Discussion

1. The most striking finding was that the 66 patients denied any feeling of pain during the injection (Fig. 6). This observation agrees with the findings of other investigators that pain was almost totally absent during injection.[1,5]

2. Extraction of teeth, both mandibular and maxillary, and cavity preparation of all classes were successfully accomplished in 87 per cent of the cases (Fig. 6).

3. Unsuccessful attempts due to poor anesthesia were recorded in 13 per cent. In this latter group, additional injections had to be made to permit successful completion of the procedure. It should be pointed out, however, that reinjection of patients is required occasionally when using the customary needle and syringe.

4. In 28 per cent no bleeding resulted following injection and in 59 per cent only slight bleeding was apparent (Fig. 7).

5. In 13 per cent, however, moderate to heavy bleeding was observed but was controlled easily by holding a 2- by 2- inch sterile gauze pad with pressure over the puncture site for one to two minutes.

6. It was noted that mucosal lacerations were present in the majority of patients in whom bleeding was a problem. The incidence of moderate to heavy bleeding using a needle is negligible.

Additional Observations

In general, the larger the orifice, the greater was the tendency for laceration and bleeding. Further studies are needed to confirm this observation. Tenderness at the site of injection, persisting for 24 to 48 hours, was noticed in only a few instances. This occurs occasionally when using

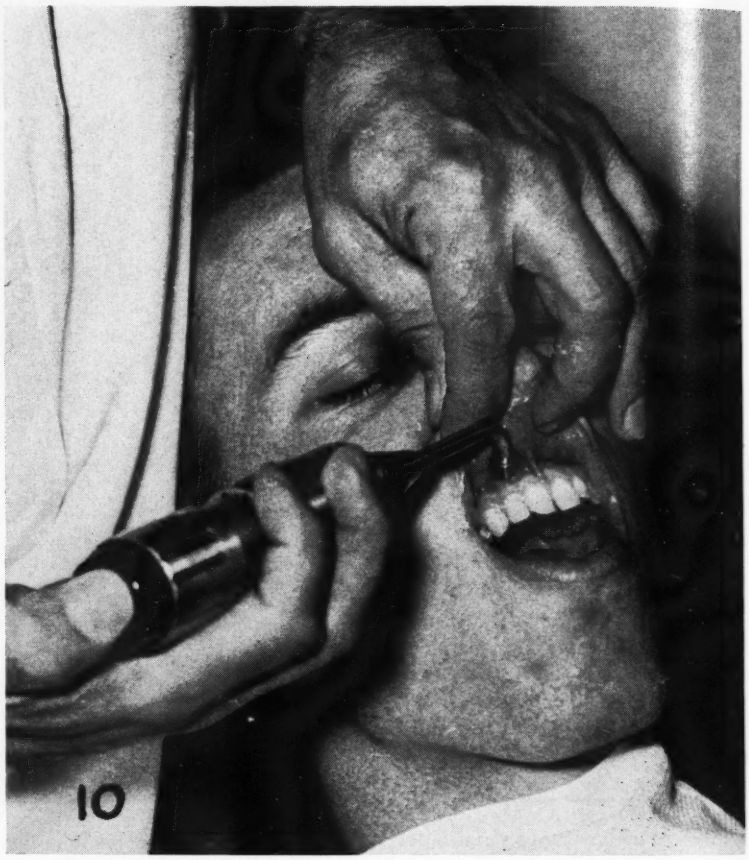
the needle and syringe technique. Healing following extractions was uneventful and examination of injection sites for periods extending up to 8 months revealed no abnormalities.

Transmission of Infection Slight—Inasmuch as there is theoretically no penetration of the mucosa by anything other than a sterile column of liquid, the hazard of transmitting infectious hepatitis probably is slight, although further data are required before it may be dismissed. It is further obvious that the danger of needle breakage during injection does not exist.

Tissue Distortion Slight — One might question whether the injection of 0.6 milliliter of liquid in a fraction of a second would result in a "ballooning" of the areas injected. This has not been observed. Figge and Barnett[7] have shown, according to Pascal's law, that a small force amounting only to a few grams, is transmitted to the tissue in contact with the orifice. Preston, Goldman, and Thompson[8] reported that a mild degree of tissue distortion occurs in the immediate path of the fluid, but that there was no tissue destruction adjacent to this area.

Technical Differentiation—According to the same investigators, repeated efforts were made, in dermatopathologic conferences, to determine whether the particular skin biopsy specimen under study had been infiltrated by a needle or a jet injector. They found it impossible to differentiate between the two techniques without examining the immediate area. Biopsies done on extremely fragile lesions showed no distortion of architecture following jet injection into the tissues.

Prevention of Trauma — Warren and co-workers reported that in a large series of injections of saline-suspended biologicals no apparent trauma was caused. They further stated, "It appears reasonable to state at this time that, while considerably more study of jet injection is needed, the procedure will rarely cause undue trauma, provided certain basic precautions are observed."[9] Among these are the use of jets of a diameter of less than 0.008 inch and the proper selection of site and injected material.



10. ***Dental patient receiving local anesthesia by use of United States Army's experimental Jet Injector.***

Summary and Conclusion

It has been shown that dental local anesthesia of sufficient depth and duration to complete successfully routine operative and surgical procedures is feasible utilizing the jet injection principle.

Advantages—Jet injection has the following advantages: (1) no discernible injection pain; (2) danger of transmitting infectious hepatitis may be less than with the conventional syringe and needle; (3) eliminates hazard of needle fractures during injection; (4) ease of sterilization; (5) the psychic trauma of needle injections is obviated.

Disadvantages—(1) The high incidence of bleeding at the injection site and (2) the cost of the jet injector and the Metapules are disadvantages of jet injection.

Basic Change in Technique—These preliminary studies present the first basic change in injection technique in the history of dentistry. The results of this study warrant further investigation to determine the optimal orifice size and spring pressure for a jet injector designed specifically for use in dentistry. An injector with which these factors could be determined has been designed and is shown in Figures 8, 9, and 10.

Adapted from *United States Armed Forces Medical Journal* **9**:625-634 (May) 1958.

[7]Figge, F. H., and Barnett, D. J.: Anatomic Evaluation of Jet Injection Instrument Designed to Minimize Pain and Inconvenience of Parenteral Therapy, Am. Practitioner **3**:197 (Dec). 1958.

[8]Preston, R. H.; Goldman, L.; and Thompson, R. G.: Use of Hypospray in Dermatology, A.M.A. Arch. Dermat. & Syph. **64**:327-339 (Sept.) 1951.

[9]Warren, J.; Ziherl, F. A.; Kish, A. W.; and Ziherl, L. A.: Large-scale Administration of Vaccines by Means of Automatic Jet Injection Syringe, JAMA **157**:633-637 (Feb. 19) 1955.

The Typadon in Fixed

PARTIAL PROSTHODONTICS

FREDERICK J. METZGER, D.D.S., Buffalo, New York

DIGEST

Since the gold casting process was developed, many different methods of fabricating a cast gold fixed bridge have been described in dental literature. A device is now available, the typadon[1], which makes it possible to construct fixed bridges faster and with more precision than techniques previously used. A description of the device is presented herein and step-by-step instructions are given for the technique involved.

Description

The typadon is made of rigid plastic, and is keyed on both its surfaces: (1) One surface is keyed to hold the stone cast in a fixed position, (2) the opposite surface is keyed so that the typadon can be plaster mounted to an articulator. A pin running through the typadon and the stone cast holds the sections of the cast in position after it has been cut with a fine jeweler's saw. Figure 1 shows two quarter typadons, which can be used for any of the four quadrants of the mouth. A full mouth typadon (not shown) is also available that makes possible the construction of a series of crowns or fixed bridges for the entire area.

Technique

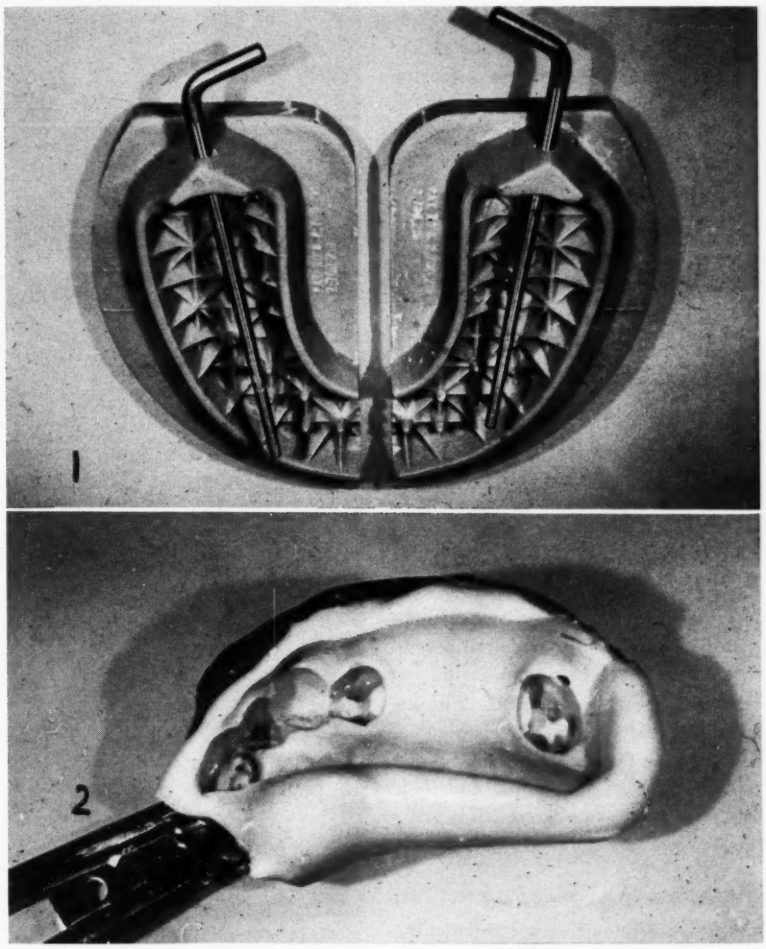
To complete the technique the following steps are taken:

1) The abutment teeth are prepared for the type of crown indicated from a thorough study of the case.

(2) One overall alginate impression is taken of the abutment teeth and the edentulous area (Fig. 2).

(3) An alginate impression is taken of the opposing teeth; a wax bite registration is taken and the shade is chosen.

(4) The abutment alginate impression is dried slightly, and die stone is vibrated into the impression. A portion of the same mix of die stone is vibrated into the typadon and around the pin.



1. ***View of two quarter typadons. Can be used for all four quadrants.***

2. ***Alginate or rubber base impression of prepared abutments and edentulous area.***

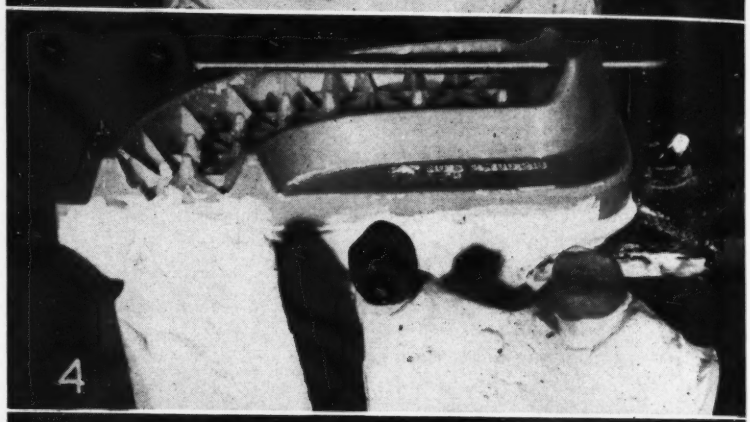
[1]Typadon—The Typadon Company, 1937 34th West, Seattle, Washington.

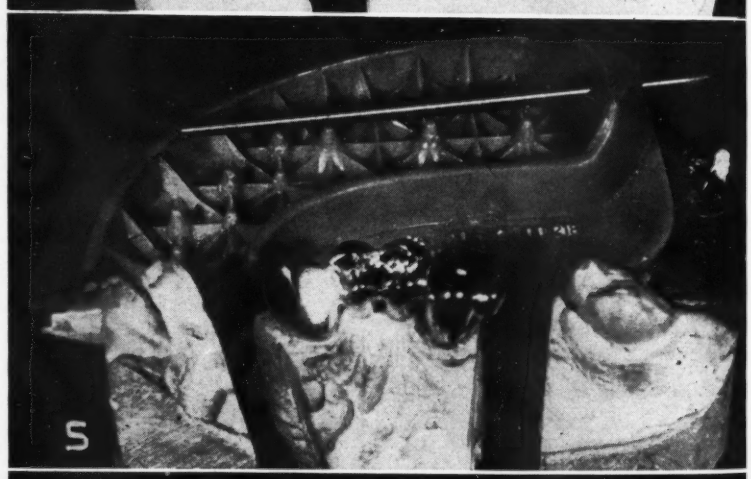
3. ***View of typadon, upper and lower casts, mounted on articulator. Note the position of fine cuts through the upper cast.***

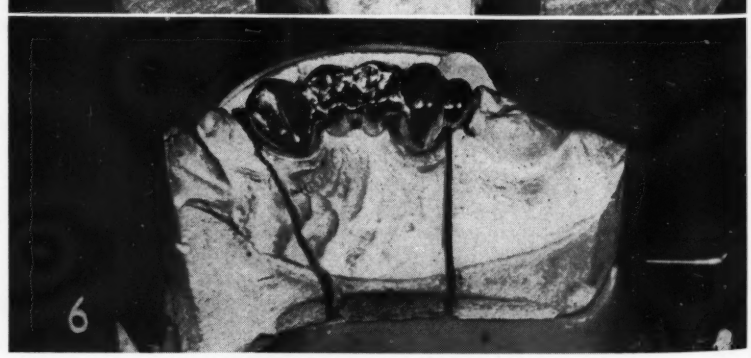
4. ***View showing the two abutment teeth and edentulous area in one working die segment. DuraLay Resin is used as a coping (molar) under inlay wax.***

5. ***View showing completed bridge on working die segment after soldering. Unassembled on typadon.***

6. ***Finished bridge assembled on typadon. Note gold pontic filling space to second molar.***







(5) The filled impression is inverted onto the filled typadon, and centered according to markings on the device.

(6) The die stone is allowed to set under water.

(7) After thirty minutes, while the cast is still wet, the pin can easily be removed; it can be reinserted for future use.

(8) The typadon with its attached stone cast, together with the opposing cast, are mounted on an articulator in a position so that the pin will be easily accessible (Fig. 3). An articulator, called a correlator, is available which allows easy access to the pin.

Completion of Technique

(1) The working cast is removed from the typadon by removing the pin.

(2) The cast is cut into sections using a fine jeweler's saw and carborundum discs. The two abutment teeth, and the edentulous area must be in one segment. This segment is used as a working die for the waxing and carving of the crowns (Fig. 4).

(3) The same working die segment is used to construct the type of pontics desired, and for the final assembly of the units before soldering.

(4) The different segments of the working cast are only assembled on the typadon to acquire proper contact points between the crowns and their adjacent teeth, and to establish articulation with the opposing cast.

Time-Saving Method

The number of appointments for the patient is reduced to a minimum with this technique. Three appointments are usually made: (1) An appointment for the abutment preparations, (2) a second appointment for the impressions, bite, and shade, and (3) an appointment for the cementation of the finished bridge. If preferred, however, the first two appointments may be combined into one long, approximately two-hour appointment.

306 *Brisbane Building*

The EDITOR'S *Page*

SCARCELY a week passes in the practice of most busy dentists that some patient does not ask for treatment of the common "canker sore." Most of our treatments are empiric. The aphthous lesion is often associated with dietary indiscretions which would suggest a possible allergic reaction in susceptible subjects. Canker sores may also be present during menstruation and this suggests an endocrine disturbance. Oral tissues that have been traumatized by cotton rolls or other irritants may be the site of these painful sores. There is also some evidence that apthae are expressions of an invasion of an unknown and unidentified virus. In all cases the mechanism of causation is obscure.

The application of silver nitrate or chromic acid may desensitize the part but may also cauterize the tissue and thus delay healing. Virtually every chemical that has been used in mouthwashes has been tried but the results have been unsatisfactory. Hydrocortisone in the 2.5 per cent dental ointment has given good results in some cases but is not exactly a specific therapy.

Two British clinicians of the University of Oxford[1] have suggested the use of hydrocortisone in a form that is freely soluble in water: "The mouth is far from a suitable place for the use of an ointment for local therapy. The whole surface is bathed in saliva, which must impede the action of a substance that is carried in an ointment. The movements of the tongue and cheeks make it impossible that an ointment will stay long in place on any localized lesion within the mouth. It occurred to us to make a virtue out of necessity by using a water-soluble compound of hydrocortisone which would dissolve in the saliva. Instead of being an inconvenient barrier, the saliva then becomes the actual solvent for the hydrocortisone and the medium by which it is transported to the lesion. At our request Glaxo Laboratories prepared a tablet especially for use in the mouth; it contained 2.5 milligrams of hydrocortisone in the form of its hemisuccinate sodium salt, a compound freely soluble in water and one which has proved to be beneficial in the local treatment of ulcerative colitis. The tablets have a lactose base and are designed so that they will dissolve slowly. . . .

"A tablet is easily held in the mouth and will rest in the gingival sulcus, where aphthous ulcers most commonly occur. The slow dissolution ensures that the ulcer is bathed in saliva charged with hydrocortisone for a rather long period. A certain amount of trouble must be taken to obtain contact between the tablet and the ulcer in patients with ulceration of the tongue or palate. So far as safety is concerned, our maximum dose has been four tablets a day, which represents 10 milligrams of hydrocortisone, a dose unlikely to have any harmful systemic effect, however long continued."

It is hardly necessary to warn dentists that they should not treat unresponsive lesions of the soft tissues too long. There is always the possibility that lesions that do not heal promptly may be the expressions of underlying systemic disease, including cancer. There is no rule-of-thumb to follow, but it might be proper to consider that any ulcer in the mouth that does not heal in ten days should be considered suspect and the patient should be referred for medical consultation. And a consultation should mean just that: "a meeting to exchange ideas or talk things over."

[1]Truelove, S. C., and Morris-Owen, R. M.: Treatment of Aphthous Ulceration of the Mouth, Br. M. J. No. **5071**:603 (March 15) 1958.

Comprehensive Routine

ULTRASONIC DENTISTRY

Part Two

FRANK N. SORACI, D.D.S., Yonkers, New York

DIGEST

This is the second installment of a three-part illustrated article which describes in detail the observations and conclusions formed from an extended employment of the ultrasonic unit in routine dental practice. In this installment the author presents step-by-step directions for an amalgam condensation technique and for the ultracarving technique in crown and bridge procedures.

Techniques Adapted To Ultracarving

Many of the disadvantages associated with the use of the large rotary grinding discs are eliminated with the employment of the ultrasonic unit. In the technique for amalgam condensation, although starting with a dry mix, the final result is a well-condensed, hard restoration.

(D) *Amalgam Condensation Technique*—In this technique the following steps are taken:

(1) A dry amalgam mix must be used. The mix is taken from the amalgamator capsule, squeezed dry, and placed in an amalgam well.

(2) A large portion is carried into the tooth. The cavitip usually used in ultracarving, but vibrating dry, is placed onto the inserted portion of the amalgam. The direction of the vibratory motion should be at an angle of 10 to 15 degrees to the wall being covered, not perpendicular.

(3) The tip is pressed lightly against the amalgam in the direction of each wall being covered. Thus, an initial layer of amalgam is vibrated and in this way condensed onto each wall of the preparation, to ensure preliminary adhesion and sealing of the margins with this first portion.

(4) As the entire shank of the cavitip vibrates, its most convenient section and angulation can be used for condensation.

Procedure Repeated: Another large portion is carried to the tooth and the procedure repeated. This vibratory condensation is continued until compression has been completed to one millimeter above the highest occlusal plane. For the average cavity, two or three insertions are sufficient.

Light Pressure Used—A fine touch must be used throughout. Allow the ultrasonic vibrations to do the compression with the operator merely directing the cavitip. Less than an ounce of pressure is needed. Excessive pressure may plunge the cavitip into the already condensed portion of the amalgam, causing unnecessary disturbance of the restoration and possible burnishing.

Final Phase: The cavitip is placed so that the entire length of the shank is in contact with all or most of the outer surface of the amalgam. It is permitted to vibrate a few seconds, thus releasing any remaining excess mercury and completing the condensation.

Contouring Procedure: The matrix band is immediately removed, as the restoration is already semihard. Contouring to tooth form and bite is performed either with the dry vibrating cavitip angulated in the direction of the cusps (Figs. 11, and 12) or with routine hard carvers. During the contouring, the early hardness of the restoration can be easily felt and observed. Further finishing is rarely needed.

Evidence of Excellent Condensation: During the compression with hollow cavitip (Number 71), beads of excess mercury can be observed emanating through the center hole and out of the irrigation hole of the cavitip. This signifies formation of a well-condensed, hard restoration, as excess mercury has been expressed, although the operator had started with a dry mix.

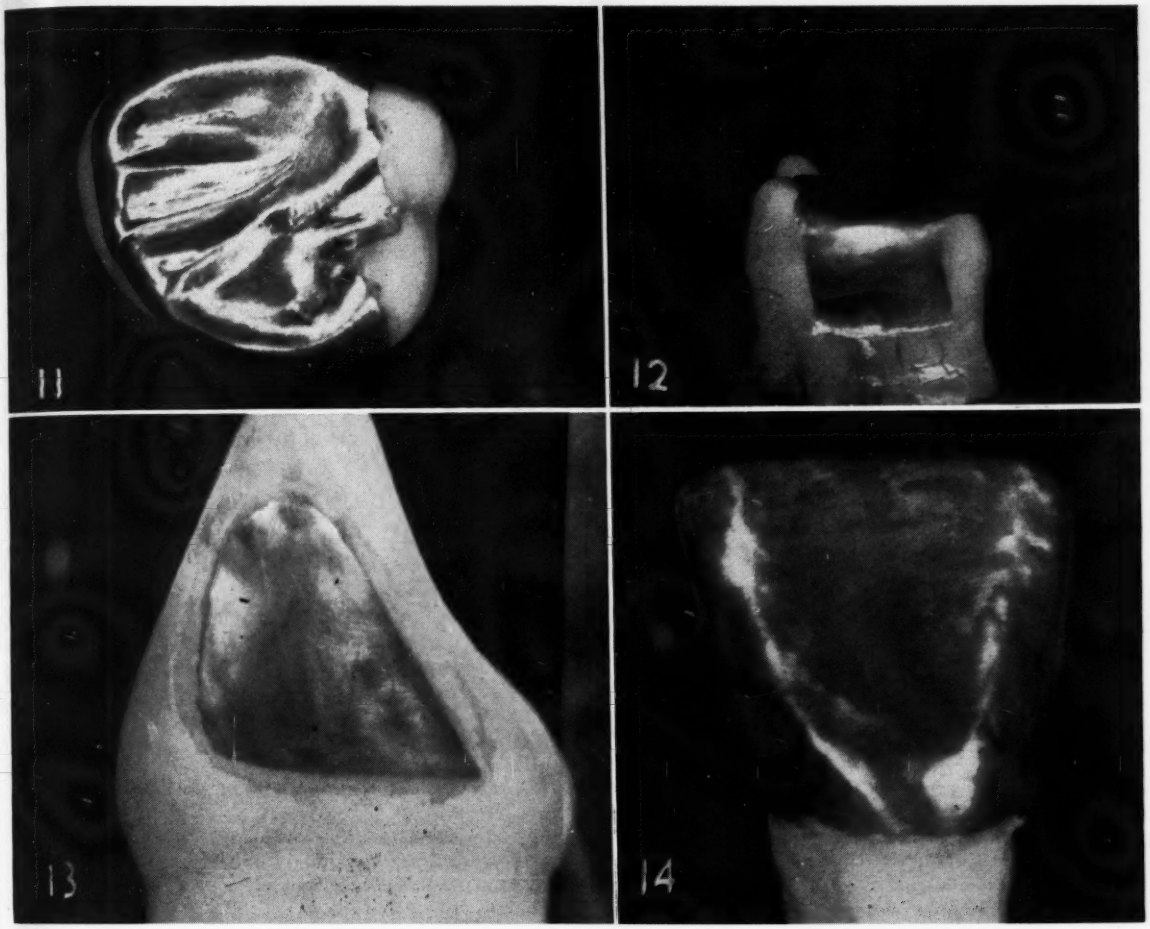
Cavitip Used: To date, cavitip 71 has proved to be the most convenient and most efficient tip for the compression of amalgam, but cavitip 33 is also good.

Effectiveness Illustrated: A striking illustration of the effectiveness of ultrasonic amalgam condensation can be seen on the large plaster models (Figs. 13, and 14).

(E) *Crown and Bridge*—For crown and bridge procedures, ultracarving is rapid, precise, and requires little changing of cavitips. Moreover, the noise, fear, and lacerations of the gingiva associated with the large rotary grinding wheels and discs are completely eliminated.

New Approach Evolved: The wide cavitips originally designed for crown preparation, although usable, were not efficient or rapid cutting. Therefore, a new approach for crown preparation had to be evolved, using the smaller, faster cavitips. This evolution has resulted in more comfort for the patient and better accessibility for the operator without sacrifice of speed and efficiency.

Occlusogingival Length Satisfactory: Basically, the methods devel-



11. ***Occlusal view of an MODF amalgam restoration, anatomized ultrasonically and lightly polished one hour after completion of vibratory condensation. The long axis of the vibrating tip is used to condense the amalgam onto the walls of the preparation while the forward edge performs the condensing onto the pulpal and gingival floors. The minute hollow in cavatip 71 prevents excess pressure on the pulpal floor and avoids layering of the amalgam.***

12. ***Proximal view of an MODF amalgam restoration.***

13. ***Class III ultrasonically condensed amalgam restoration in large plaster model for experimental purposes.***

14. ***Three-quarter crown ultrasonically condensed amalgam restoration in large plaster model.***

oped are derived from the fact that the cavitips used are not wide enough to cover an entire surface of a tooth as do the rotary wheels, although they are long enough occlusogingivally.

Different Method Employed: With the small cavitips, the operator must reduce the tooth in buccolingual and mesiodistal directions. This method is different from that used for occlusogingival reduction with the rotary drill.

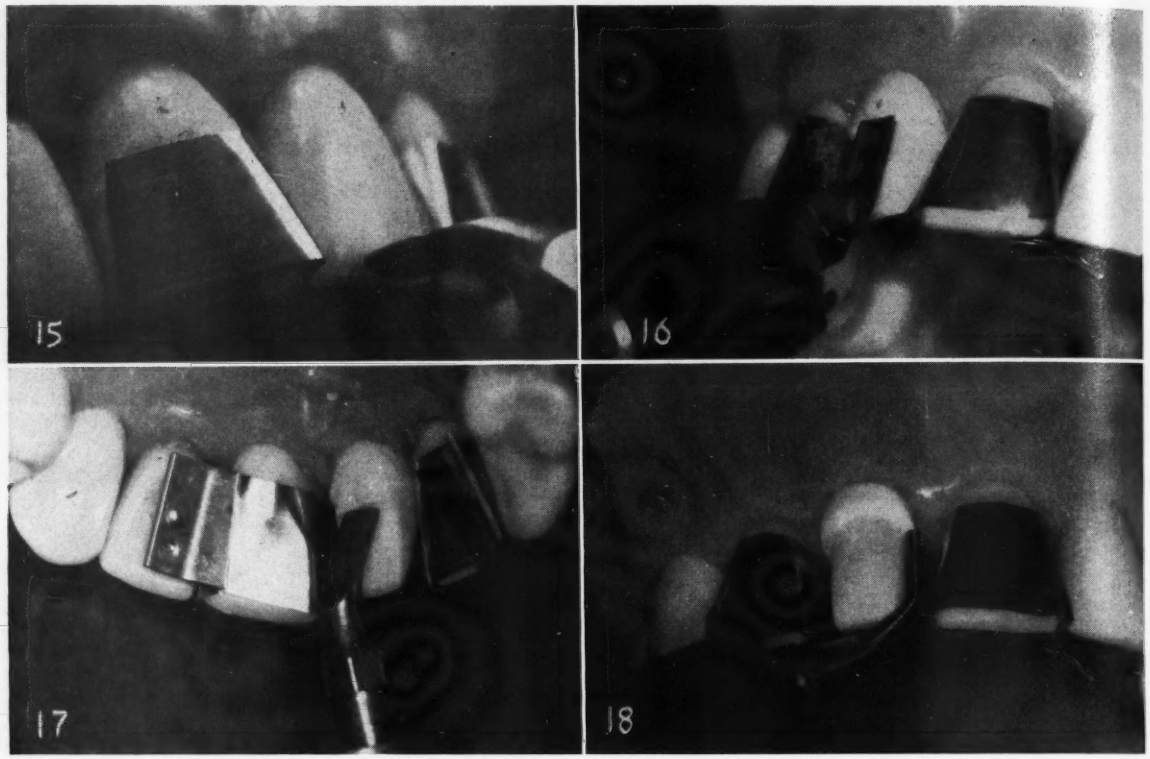
Relative Periods of Time Involved: Because of the rapid cutting action, the time involved compares favorably with the cumbersome rotary instruments. The time is less for anterior preparations, the same for bicuspid preparations, and sometimes longer for molar preparations. Moreover, even in the instances when the time may be increased, it is offset by the comfort for the patient and convenience for the operator.

Anterior Crown Procedure: Steps employed for the anterior jacket or veneer crown preparation are detailed in Figures 15, 16, 17, and 18. Concave, convex cavitip 40 is used throughout, exceupt for final rounding of the line angles and finishing of the shoulder. For these steps, cavitip 331 is used for the preparation.

Posterior Full Crown Procedure: Cavitips 15 and 331 are utilized. The following steps are employed:

(1) Occlusal Reduction. Cavitip 15 is placed flatwise at the center of and at right angles to the buccal surface at an area one millimeter below the deepest occlusal buccolingual fissure. A buccolingual primary groove is made. From this cut, the cavitip is directed mesially, returned to the primary groove, directed distally, completing the occlusal reduction.

(2) Buccal and Lingual Reduction. The same cavitip is placed lengthwise

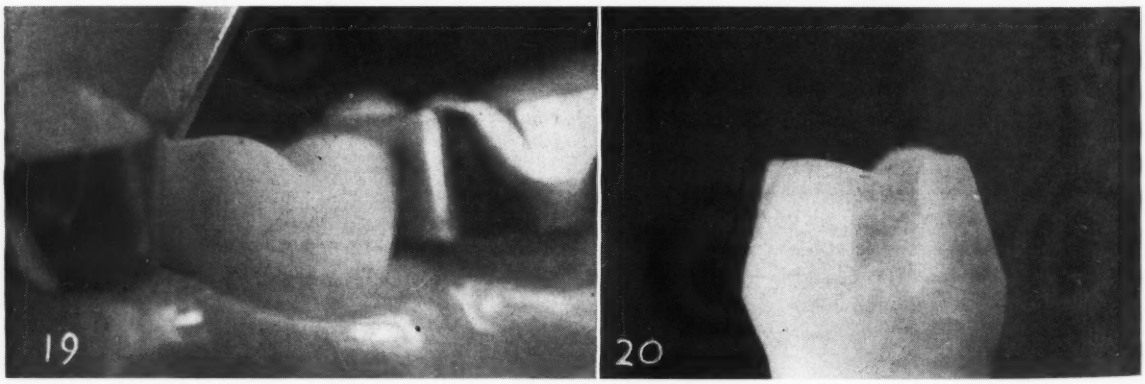


15. ***Cavitip 40 in position for first cut two millimeters from the incisal edge and at right angles to the long axis. This cut is made labio-lingually. Then the tip is directed mesially, returned to the starting area and directed distally, completing the incisal cut.***

16. ***Following the near completion of the mesial and distal cuts, the cavitip is placed in position for ultracarving of the labial surface.***

17. ***Position of cavitip for lingual cut. The forward edge of the cavitip performs the ultracarving for this surface.***

18. ***Cavitip 331 in use for final finishing of shoulder and rounding off of line angles.***

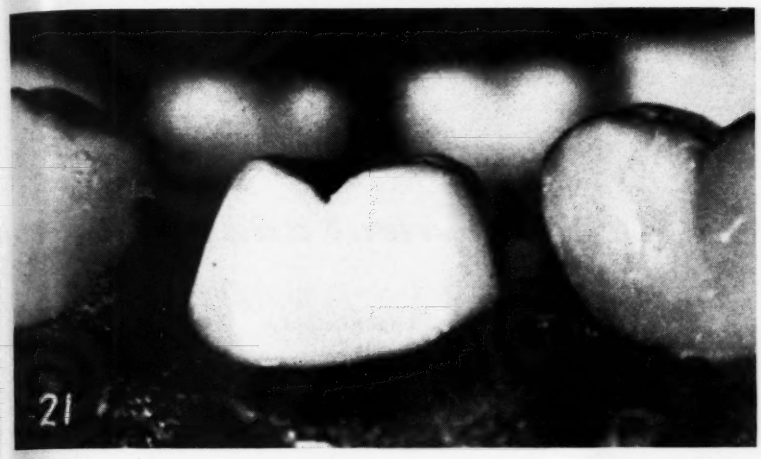


19. ***Occlusal, buccal, and lingual surfaces of lower molar*** **reduced. Cavitip in position for reduction of mesial surface.**

20. ***Primary mesial cut completed.***

at the center of the bucco-occlusal line angle, directed gingivally at an angulation to form a groove one or two millimeters deep at the starting area and tapering to a well-defined finishing line. From this groove the cavitip is directed mesially, then distally, completing the buccal reduction. The lingual reduction is made in the same manner.

(3) Mesial and Distal Reduction. Cavitip 15 is placed at the center of the mesio-occlusal line angle (Fig. 19). A tapering primary groove is made occlusogingivally to a defined finishing line (Fig. 20). From this groove, the cavitip is directed buccally, then lingually. The distal surface



21. ***Completed full crown preparation.***

is reduced and prepared similarly.

(4) Completion of Technique. For deepening of the occlusal fissures, if necessary, the tip is held at right angles to the occlusal surface and ultracarving is performed to the desired depth. For additional rounding of the line angles and smoothing of the preparation, either cavitip 15 or 331 is used with a continuous, slow, light, back and forth motion so as not to cut deeper into the already prepared surfaces (Fig. 21).

(*End Part Two*)

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Replantation of the Mandible in Cancer Surgery

Method Used in Selected Cases

In patients subjected to cancer surgery in whom a partial resection of the mandible is necessary, it is important to maintain stability of the mandible and pharyngeal funnel after surgery. One method which can be used in selected cases is to prepare devitalized anatomic bone splint by salvaging the resected bone, cleaning out the diseased portion, and then sterilizing the residual bone in the autoclave. This splint is then fixed to the retained segments of the mandible. It has the proper shape and strength for replantation and stability, provided enough normal bone remains in the specimen to give mechanical support. The splint then seems to act as a tolerated foreign body; it becomes surrounded by a fibrous capsule, and is resorbed slowly over a long period of time.

Prerequisition — To utilize this method successfully several prerequisites should be fulfilled:

1. It should be possible to close the opening in the mouth and still have a soft tissue sleeve in which the bone splint will fit. When the patient has an epidermoid carcinoma that invades the mandible, considerable soft tissue about the primary tumor is usually sacrificed as well as the regional lymph nodes and part of the mandible. It may not always be possible to obtain a satisfactory soft tissue closure to cover the splint in the mouth, and in such a case it is probably better to use a pin.

2. There must be enough normal bone left in the resected portion of the mandible so that it can serve as a mechanical strut.

Aid in Reimplantation—This splint has the proper shape and strength for reimplantation and stability. It has been helpful in cases in which the symphysis has been lost, since if the tissues of the chin are allowed to collapse they become so contracted it is impossible to build them up to their original shape again unless additional soft tissue is transplanted from a distant donor site.

In following the course of this splint with serial roentgenograms (1) slow resorption of the bone has been noted. (2) There has been no x-ray evidence of union between the devitalized and the host bone. Although considerable mobility at the nonunion sites would be expected, the mandible has remained quite stable. The stability is probably due to reinforcement by the dense fibrous tissue about the splint. (3) The longest period of follow-up has been three years, and although there is considerable resorption and nonunion, the mandible in this patient is still surprisingly stable. It supports a denture and permits fairly heavy chewing. There is no reason why the devitalized bone in this instance cannot be replaced with a living autogenous bone graft.

Adapted from International Abstracts of Surgery, *Surgery, Gynecology, & Obstetrics*, **106**:330 (*April*) 1958.

Enlarged Submaxillary Glands in the Aging

MORE THAN one-third of patients older than fifty years have symmetrical asymptomatic enlargement of the submaxillary glands. Careful bimanual external palpation will usually reveal the soft, smooth, painless, nontender, nonadherent swelling. The pathogenesis of this phenomenon is unknown.

The enlargement should be differentiated from more significant disease of the salivary glands. However, most patients are unaware of this condition and to inform them may arouse fear of cancer.

Of 99 consecutive patients between 51 and 90 years of age who visited an outpatient eye and ear clinic, 36 had asymptomatic enlargement of the submaxillary glands, detected during general examination. Men and women were similarly affected.

From *Modern Medicine* **26**:192 (July) 1958.

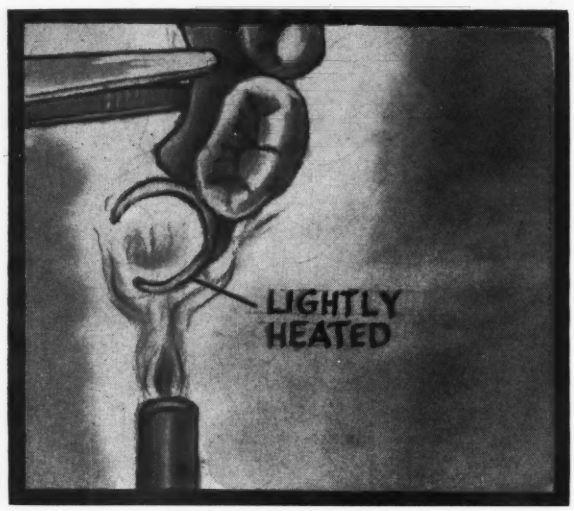
1

Clinical and Laborator

The Impacted Upper Cuspid

S. Earle Wardlaw, D.D.S., Anderson, South Carolina

1. An impacted upper cuspid that is to be used in orthodontic treatment should be covered with a plastic crown-form filled with surgical cement after the tooth has been exposed. This procedure will prevent the crown from being re-covered with soft tissue.

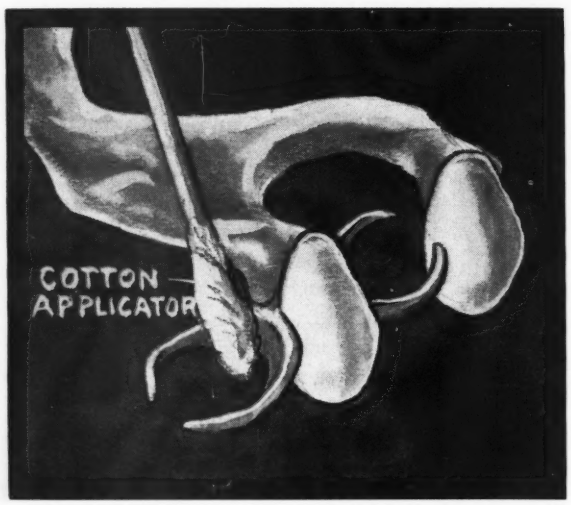


2

Adjusting a Base Metal Clasp

C. W. Pratt, D.D.S., Calumet, Michigan

2. The tip of the clasp should be *lightly* heated before it is bent for adjustment. This will reduce the danger of breakage.



3

Patient Care of Clasps

Norman Highstein, D.D.S., Baltimore, Maryland

3. To reduce the incidence of caries in teeth that retain clasps it is advisable for the patient to clean the inside of the clasp with a cotton applicator.

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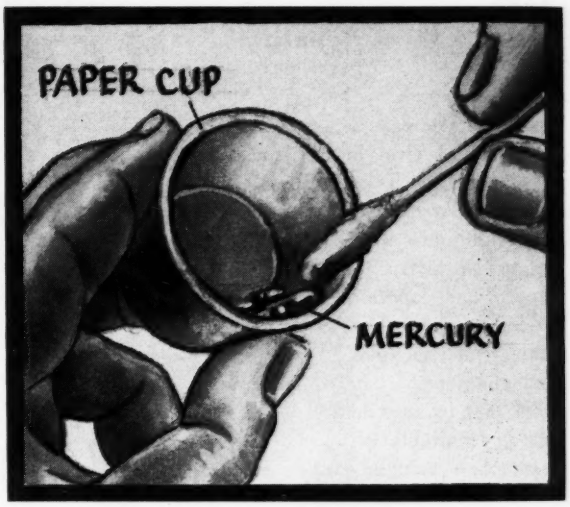
Charles Lessig, D.D.S., Cuyahoga Falls, Ohio

4. Pour the mercury in a wax paper cup and stir with an applicator. The contaminating material will remain on the wax of the cup.

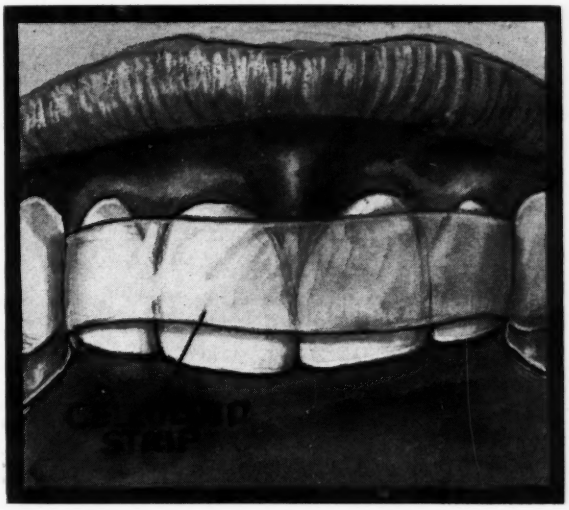


4

High-Speed Technique

S. Hutchinson, D.D.S., and Adrian M. Spitz, D.D.S., Brooklyn, New York

5. To prevent water spraying into the operator's face while preparing anterior teeth from the lingual approach, slip a piece of celluloid strip over the teeth to form a transparent shield on the labial.

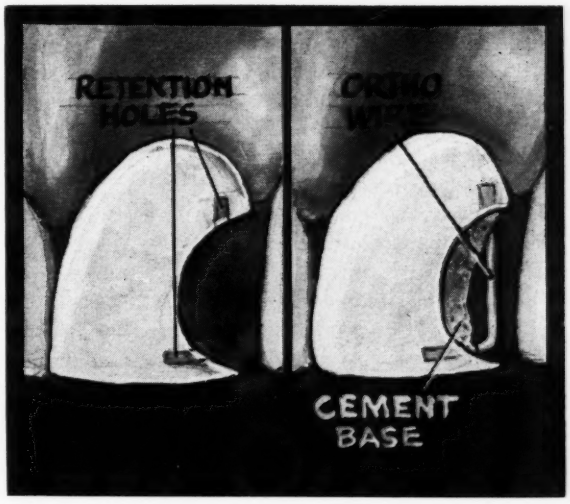


5

Reinforcement for Silicates

J. S. Frey, D.D.S., Beloit, Wisconsin

6. Drill two retention holes as shown in the drawing. When the cement base is inserted, cement a piece of orthodontic wire in the prepared holes for reinforcement.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 502 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences

Viral Hepatitis

During the past fifteen years the incidence of viral hepatitis has increased greatly. The disease is easily transmitted and difficult to inactivate. The condition is an occupational hazard for physicians, dentists, interns, nurses, and laboratory technicians. When examining and treating patients, prophylactic techniques should be maintained. It should be kept in mind that in most localities the disease is reportable.

Infection can be caused by extremely minute quantities of contaminated blood. The frequent transmitters of infection are insufficiently sterilized needles, syringes, bloodletting devices, and other instruments that penetrate the skin or mucous membranes. Epidemics have been traced to the use of unsterilized instruments for taking blood samples and to common use of syringes among narcotic addicts. The virus may be transmitted by rectal thermometers used for patients with the disease or even through razor cuts.

Unfortunately there is no reliable method available for detection of carriers of viral hepatitis. Blood transfusions, particularly pooled plasma, should, therefore, be avoided whenever possible. Blood donors should be selected cautiously. Those who have had hepatitis or jaundice are excluded. Even then it is noted that some carriers have never been jaundiced.

Irradiation of plasma with ultraviolet rays and storage for six months at room temperature have been suggested for inactivating the virus. The efficacy of these procedures is doubtful, however. Instruments used for penetrating the skin or mucous membranes and for releasing blood should be promptly and thoroughly washed and sterilized between applications. Boiling of instruments must be continued for at least thirty minutes, dry heat applied for two hours, or autoclaving performed for thirty minutes at 15 pounds pressure. Alcohol or other disinfectant solutions are not effective sterilizing agents. The safest method is to use disposable lancets.

Article (Committee on Public Health): Prevention of Viral Hepatitis, Bull. New York Acad. Med. **33**:128-131 (*February*) 1957.

Steroids— Present Status

Recently a new "plant precursor" of cortisone has been found in Agave lecheguilla. This is a weed pest found in the southwestern states. This is just one phase in the fact that more economical starting materials for the production of steroids are available. There are also more satisfactory and "specific" end products including other glucocorticoids, mineralocorticoids, and steroid anesthetics.

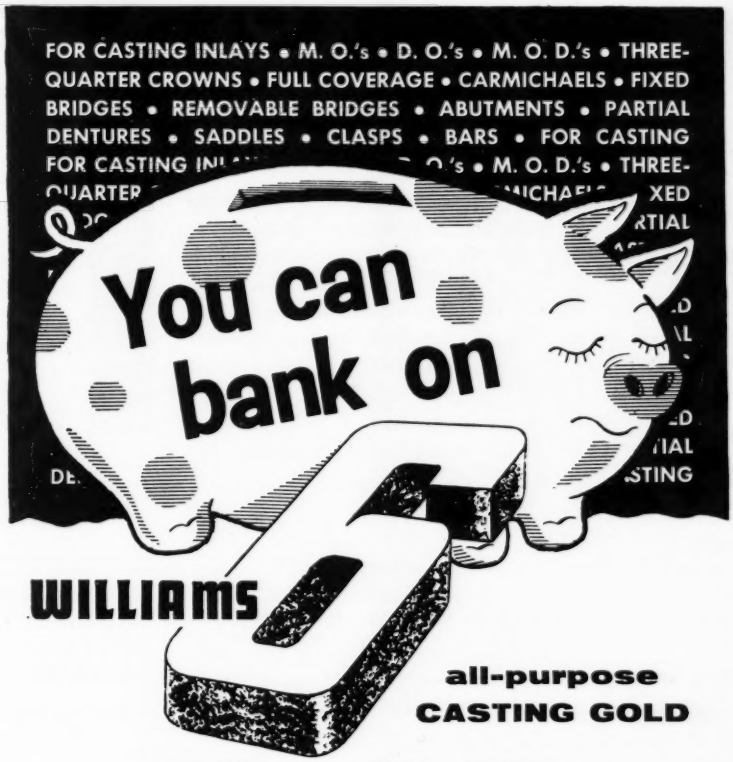
Stereo-chemistry and the General Adaptation Syndrome are emerging as a primary influence on current medical practice. Between thirty and forty steroid compounds have been isolated. A few of them have been synthesized and produced for therapeutic use on a relatively large scale. A number of derivatives and analogues have made their appearance, some possessing a higher degree of activity and lacking one or more side-effects, compared to the original compounds. All of these "natural" and derivative substances are classified in terms of the hormonal properties of the parent; that is, they are folliculoid, testoid, luteoid, corticoid, spermatogenic, renotrophic, or anesthetic steroids. The corticosteroids, in turn, comprise two, mutually antagonistic groups: the glucocorticoids, and mineral ocorticords.

The glucocorticoids include hydrocortisone, cortisone, and all of their derivatives and analogues. They exert their chief effect on the fat, protein, and carbohydrate metabolisms to promote hyperglycemia, glucosuria, and negative nitrogen balance in the absence of adequate protein.

The mineralocortoids include desoxycorticosterone and aldosterone. They are chiefly concerned with the maintenance of electrolytic balance. Aldosterone, for instance, which has been synthesized only recently, is approximately 1,000 times more effective than hydrocortisone in retaining salt and water in the body and increasing the excretion of potassium.

Nearly 80 per cent of endogenous corticosteroids consist of hydrocortisone. Hydrocortisone, cortisone, and ACTH are antiphlogistics, modifying tissue response after injury in an antiinflammatory manner. They also may increase the organism's vulnerability to bacterial invasion and predispose it to the spread of infections as do all of the other glucocorticoids, whether they are given therapeutically or occur in the body spontaneously in response to stress.

All of these antiinflammatory agents give symptomatic relief to a great many patients; not only in the treatment of collagen diseases, but also in the treatment of allergies, many dermatoses and a wide variety of other disorders which seem unrelated at first sight. All of them depress adrenal cortical function, inhibit the production of corticotrophin and lead to atrophy of the thymus and adrenal cortex. They also inhibit the activity of the lymphatic system and tend to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induce metabolic and central nervous system disturbances, more or less unpredictably.

Article: The Steroids, M. Science 1:25-29 *(March)* 1957.

Chronic Headache

The pharmacologic treatment of headache relieves symptoms by raising the threshold of pain, interrupting the mechanism producing pain, and reducing the emotional tension and anxiety associated with pain. Treatment is affected by both pharmacologic and psychologic factors.

For an occasional headache and for chronic headache of moderate intensity, the salicylates are of value. These raise the threshold of pain, possibly through depression of pain centers in the thalamus. Relatively small doses are effective. And the duration of action may be prolonged by frequent administration.

When severe pain is present, or if sedation is required, opiate analgesics are advised. Meperidine and methadon are not recommended for chronic headache because of the possibility of addiction. Codeine may be given orally or parenterally and is especially useful for headache caused by inflammation of cranial structures.

Severe or persistent headache is best relieved when hypnotics and sedatives are combined with analgesics. This combination is particularly useful for symptomatic therapy of headache due to tension. Chlorpromazine suppresses nausea associated with migraine and may be given prophylactically for tension headaches.

A small number of patients with migraine are relieved by prophylactic administration of methionine, Mesantoin® or Dilantin®. These patients include those with abnormal electroencephalograms and aphasia, paresthesia, or hemiplegia before the onset of headache. In other patients with a familial incidence of migraine and epilepsy and abnormal brain waves with spiked patterns on electroencephalograms, anticonvulsant drugs may reduce the frequency, severity, and duration of headache.

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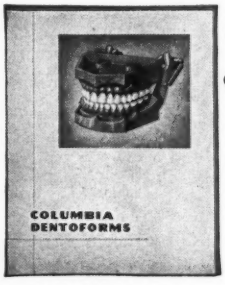

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Friedman, Arnold P., and Merritt, H. Houston: Treatment of Headache, JAMA **163**:1111-1117 (March 30) 1957.

Acromegaly

There are many targets throughout the body for the growth hormone of the anterior pituitary (somatotropin). Among these targets is the skeleton. Gigantism is seen when there is a superabundance of growth hormone in young people before epiphyseal union takes place. When the epiphyses have united, as noted in adult life, the growth of the bone is transverse rather than longitudinal. The terminal parts of the skeleton enlarge and the condition is termed acromegaly: If the disease begins in adolescence and continues into adult life, "acromegalic gigantism" is the consequence.

The growth hormone is believed to arise in the eosinophilic cells of the anterior pituitary. The most common cause of their oversecretion is the presence of an eosinophilic adenoma.

Usually the early symptoms are nonspecific. They include fatigability, weakness, aches and pains, and excessive sweating. By the time the patient appears for aid he usually complains that he has to buy larger hats, gloves, and shoes. He may present with headache or, quite late in the disease, with progressive blindness.

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In the typical case, the diagnosis is apparent at first glance. The patient has coarse features, a bulbous nose, thick lips, a huge lower jaw, and a large tongue. The forehead bulges and the skin is thickened and ridged. There is a noticeable increase in facial hair in women. The voice is deepened. The posture is stooped, the hands are large and spadelike, and the feet are widened. Many tissues and organs of the body may be involved; women may begin lactating, the liver and spleen become prominent, the kidneys palpable, and the heart may reach tremendous size.

Active growth of the base of the cranium may cause headache. This symptom is quite ominous. The pituitary is confined in the rather small sella turcica. The tumor may, therefore, give rise to severe headache by pressing on the dural diaphragm above, or worse, it may rupture through the diaphragm at which time the headache disappears.

In most patients there is an elevated basal metabolic rate with an enlarged thyroid present in many. About 1 patient in 5 is diabetic. The greatly enlarged heart is functionally at a disadvantage and may go into congestive failure. Hypertension is common as are electrocardiographic abnormalities—largely conduction defects.

Arthritic complaints are common

in patients who have had acromegaly for some time. At first the gonads and genitalia may share in the general overgrowth of tissue, but with later compromise of all pituitary functions there is a depression of sexual activities. The patient is likely to become morose and irritable. It is a discouraging disease to have.

Treatment is difficult. Estrogens are given on an individual basis. Surgery may also be employed as a more drastic measure.

Article: Acromegaly, Spectrum 5:12-13 (January 1) 1957.

Irradiation Injury

Irradiation injury is most commonly caused by roentgeno-therapy for benign conditions such as hemangiona, nevi, acne, pruritis, neurodermatitis, and superfluous hair around the lip. A significant cause in both physicians and patients is repeated exposure during fluoroscopic examinations.

The usual sequela is chronic radiodermatitis. Manifestations of injury may not become apparent, however, for twenty years or more. The epidermis becomes extremely thin and atrophic with areas of thickening and hyperkeratosis. Atrophy of hair follicles, sebaceous glands and sweat glands results in epilation, scaling, and drying of the skin. Endothelial proliferation and subsequent thrombosis denote damage to blood vessels. Superficial ulceration may occur spontaneously or after minor trauma. The tissue resistance to infection is reduced and the healing process is retarded. Osteomyelitis and pathologic fractures of underlying bone are common.

It is recommended that superficial nonadherent, clean lesions be excised and replaced by a split-thickness skin graft. A full-thickness skin graft can usually be applied for cosmetic or functional reasons if the defect is relatively small. Lesions showing few telangiectases and only slight atrophy of the skin without hyperkeratosis or scaling do not require surgery but should be observed carefully for malignant transformation.

Cancer is common after chronic radiodermatitis. The usual form is squamous-cell carcinoma. It is often multicentric over a wide area. Metastasis occurs infrequently. Basal-cell epithelioma also may develop. Sarcoma is rare.

The entire area of disease should be excised deeply, even when only a single neoplastic focus is detected. The defect is covered immediately by a free skin graft. A pedicle flap is employed when the base of the surgical defect is lined by bone or dense fibrous tissue, a joint cavity, fistula defect, nerve, or muscle is exposed, or a bulky tissue is needed to maintain the function of a mobile and contractile structure such as the lip. Whenever possible, a local pedicle flap should be used to permit one-stage completion of the procedure.

Acute radiodermatitis is characterized by erythema and epilation. If

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The first step was to make a master shade guide composed of all the principal tooth shades available. Patients were examined for closest match possible with this master shade guide. It was demonstrated that by the addition of three new shades, the Dura-Blend shade guide offered first choice for accuracy of match more often than any other — in fact, exceeding by 44% the brand scoring second. These new Dura-Blend shades are composed of one quite bright and light, one similar but darker and one quite grey.

13 New Moulds

The new moulds introduced with Myerson's AEsthetic porcelain teeth successfully combined naturalness with cosmetic effects. To offer the same facility in plastic teeth, ten of the most popular upper anterior forms were chosen to be added to the present beautifully carved and characterized Dura-Blend moulds.

Wider Range Increases Convenience

These moulds also will be useful where the following features are indicated:

1. More subtle labial carvings.
2. Slender forms.
3. Longer ridge lap (see Figure 1).

Four of the new upper moulds are square in outline. Three lower moulds, short in relation to width, have been added to increase convenience.

Tested for Detectability

Naturalness is often claimed for artificial teeth without any proof whatsoever. It was decided to actually *test* Dura-Blend teeth for this very important feature.

Representative Dura-Blend teeth were used in an anterior partial. The surrounding natural teeth were characteristic in appearance of good health and good dental care.

Figure 1. Dura-Blend now offers choice of profile (A) Characteristic of new moulds; (B) Typical of many existing moulds.

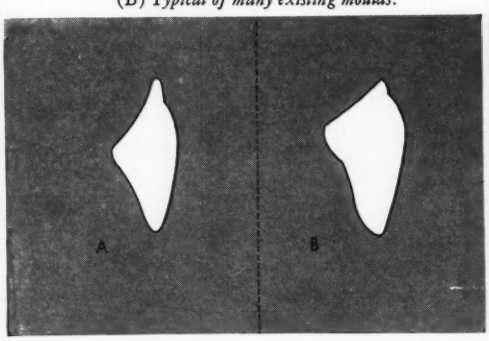
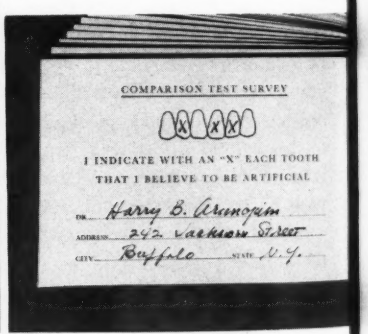


Figure 2. Forms used to record dentists' choices in detectability test.


COMPARISON TEST SURVEY

I INDICATE WITH AN "X" EACH TOOTH THAT I BELIEVE TO BE ARTIFICIAL

DR. Harry B. Arrington

ADDRESS 242 Jackson Street

CITY Buffalo STATE N.Y.

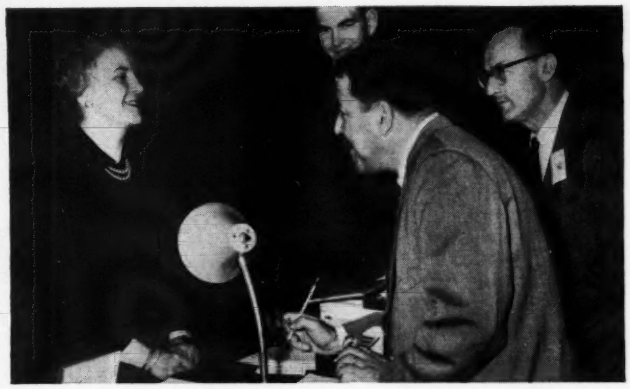


Figure 3. Dentist examining patient at close range in Dura-Blend detectability test.

The patient was displayed at the 1958 meetings of the Dental Society of the State of New York, the Massachusetts Dental Society and the Ontario Dental Society.

Lights were placed so as to give 100 foot candles illumination on the teeth. All dentists attending these meetings were eligible to participate. The patient was placed so that an examination by the dentist with his eye two feet from the patient's teeth was comfortable. The dentist was given a card on which to indicate which teeth were artificial (see Figures 2 and 3).

Results

The results of the test were tabulated separately for each of the meetings. They were so uniform that it became clear that the total for the three meetings was a statistically significant result within the limits required for this test. The results are in Table I. An answer was considered correct when the participant correctly indicated the artificial and the natural teeth. No allowance was made for chance correctness, although many participants commented that they were just guessing.

Table I

Meeting	No. of Participants	No. of Correct	% Correct
Boston	138	11	8.0
Buffalo	112	14	12.5
Toronto	104	13	12.5
TOTAL	354	38	10.7

It is safe to conclude that teeth scoring as shown, under the severe conditions described, are actually *undetectable under ordinary conditions.*

Maximum Satisfaction with Dura-Blend Anterior Teeth

With undetectability, plus the superior facilities for shade match plus greater convenience of the amplified range of shapes and sizes, maximum satisfaction for both the dentist and the denture patient is now attainable by the use of Myerson Dura-Blend Anterior Teeth. Their durability is still unequaled and is backed by a record of ten years of successful use in hundreds of thousands of cases all over the world.

Write for new shade guide and new mould chart. Address: Myerson Tooth Corporation, 91-90 Hamilton Street, Cambridge 39, Massachusetts.

Advertisement

the dose is massive, extensive necrosis occurs with formation of a foul gray ulcer, often with bacterial infection. Radical excision and immediate coverage with a pedicle graft are essential for relief of pain and ultimate healing.

Exposure of the maxilla before the age of 4 years retards growth of the bone, resulting in hypoplasia of the involved area and distortion of the normal facial pattern. Growth of the mandible is also slowed, resulting in shortening, retrusion, and narrowing with poor dental occlusion. Permanent dentition is delayed and the teeth are predisposed to caries formation.

A slightly depressed area is often corrected by a thick pedicle graft. For a severe depression, cartilage and dermal fat grafts are also used. Extraction of the teeth and a prosthetic appliance to restore function and improve the appearance of the retarded chin are often necessary.

Shortening and bowing of the extremities and deformed vertebrae are permanent effects of irradiation before the epiphyses close.

Macomber, W. Brandon; Wang, K. H. Mark; Traube, John C.; and Kanzler, Reinhold: Irradiation Injuries, Acute and Chronic, and Sequelae, Plast. Reconstruc. Surg. **19**:9-27 *(January)* 1957.

Chronic Refractory Mouth Disorders in the Aged, Symposium on Difficult Office Problems

C. M. EPSTEEN, M.D., D.D.S.

The care of chronic mouth disorders in the loosely defined group referred to as aged has often been one of shifting responsibility to either the dental profession or the otolaryngologist . . . . Every patient complaining over a considerable period of time of a sore mouth and burning tongue merits at least a complete differential blood count and urine examination to apprehend pernicious anemia, leukemia, syphilis, or diabetes, if present. Less often miliary gumma may indicate a complete serological survey and a single lesion a biopsy. Most of the conditions are more annoying and disturbing than serious. If the patient's complaints are not given thorough consideration but are just glossed over with, "There's nothing wrong with your mouth," he can become a mental problem. One of the most common and distressing complaints is the "burning tongue." . . . .Vitamin deficiencies may produce not only a burning tongue but also a general stomatitis . . . . Geographic tongue is more frightening to the patient than organically injurious . . . .The scrotal tongue is a harmless, deeply fissured tongue . . . . Senescence also presents changes in the oral cavity comparable to those observed in other tissues in the body.

From *The Medical Clinics of North America, (March)* 1958 in *Journal of the American Medical Association* **167**:548 (*May* 31) 1958.

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 494 *and* 495)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor
DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.
$10 will be paid on publication for each suggestion that is used.

Contra-Angles

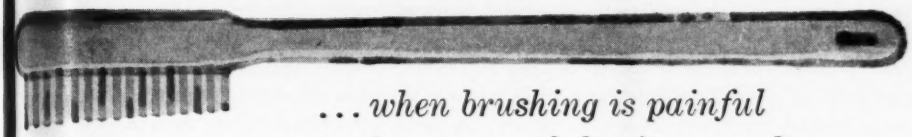
Advertising Versus Publicity

The Code of Ethics and the laws of most states prohibit the dentist from advertising. Dentistry is not a commodity and cannot be offered for sale as such. In theory the status of dentistry is degraded in those states where advertising is still permitted. The idea is that price advertising and flamboyant promises by advertising dentists will pull down the esteem of the ethical dentists in the public eye. That would not seem to be the case in California. The landscape in California is covered with the blatant signs of advertisers, but the status of ethical dentistry in California is extremely high. Some of the best dentists, finest offices, and most successful practices in the country are in that state.

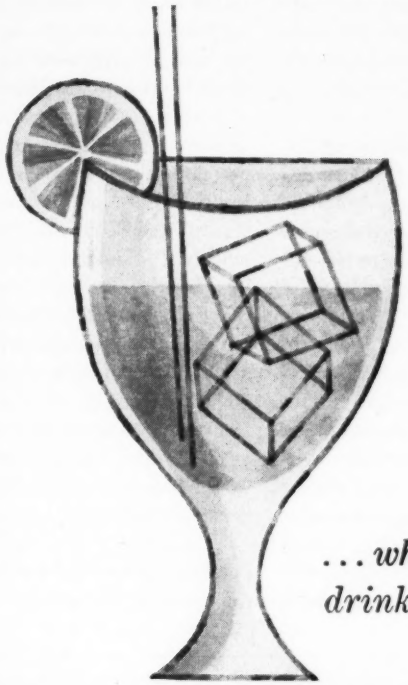
Despite frowns against advertising by individual dentists, more and more money is being spent by dental societies in public information and publicity activities. Virtually all the large dental societies and many of the smaller have hired public relations counsels to direct their efforts toward seeing (or hoping to see) dentistry appear in the most favorable light before the public.

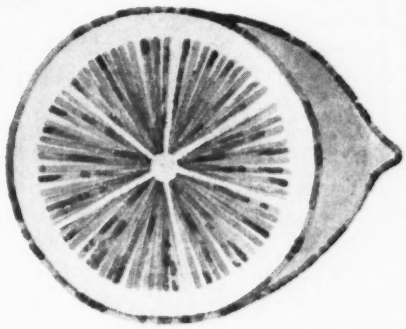
A fact that is not generally known is that newspaper publishers and editors resent professional organizations that prohibit advertising but encourage publicity. The trade paper of journalism (*Editor and Publisher*) quotes the American Newspaper Publishers Association as stating: "This distaste for advertising [by professional organizations] is not altruistic. That can be witnessed by the fact that no one of these groups refuses publicity if it is free. It is *paid* ad-

(*Continued on page* 504)



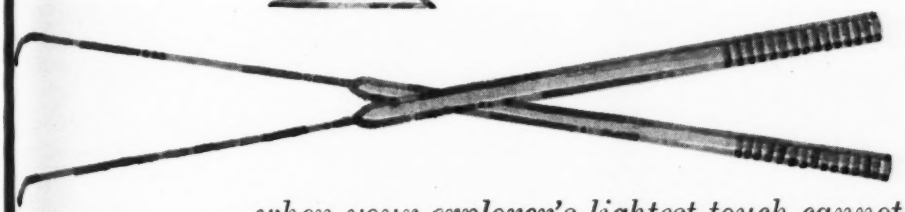
. . . when brushing is painful and poor mouth hygiene results





. . . when acid fruits are not fully enjoyed

. . . when hot or cold food and drink cannot be tolerated



. . . when your explorer's lightest touch cannot be endured

put your patient on

Thermodent™

Tooth Paste . . . *for hypersensitive teeth*

The most recent report[1] on Thermodent, in which 74 patients were studied, states that 77% realized moderate to complete relief of hypersensitivity. In increasing numbers, patients who formerly could be treated only occasionally now enjoy *continuous* relief through routine brushing with this "at-home" adjunct to office therapy. Not only can they tolerate hot and cold food and drink in comfort, but daily brushing without pain is once again possible. Regular use of Thermodent also helps to overcome the discomfort of dental instrumentation.

Promoted only to the dental profession, Thermodent is available in 2-oz. tubes at all pharmacies.

1. Abel, I.: Oral Surg. *11*:491 (May) 1958.

Thos. Leeming & Co., Inc. 155 East 44th St., New York 17, N. Y.

vertising which seems repugnant to them.

"Any law prohibiting any person from conveying a message to the public either through news or paid advertising columns abridges the right of those individuals to disseminate truthful information about themselves, or availability of goods, wares or services."

The newspaper publishers have a point. It might seem incongruous to them to witness a professional group spending thousands of dollars a year to get free and favorable publicity and at the same time deny the newspaper the revenue that comes from paid advertising. Producing a newspaper is a costly venture and most of the income is from advertising. It is quite easy to understand how newspaper people may look upon the publicity counsels and agents for professional groups as "free loaders."

Despite the delicate situation that stands between the newspapers and the professional organizations that have anti-advertising bans the quality of coverage on professional subjects is better every year. The not-too-old practice of trying to hang a "clever" headline and a smart aleck story on every dental subject is not now seen so often. Many of the metropolitan papers have science editors who cover dental meetings with skill and comprehension. Even the small papers are doing commendable jobs in reporting dental subjects.

Although newspaper men would resist the suggestion, it is possible that the improved editorial coverage of dental subjects has resulted because dentistry has been elevated in the public esteem by the prohibition of advertising by dentists. As long as dentists were peddling handbills, using gruesomely illustrated advertisements, flashing neon lights from their offices, they were in lower caste in the public eye. When the dentist evolved from a merchant to a professional man in the social caste system (and there is such a thing in the United States) the newspaper people treated him and his professional activity with more dignity and greater respect.

I have not heard any dentist who had a professional orientation suggest that we should return to the practice of advertising by *individual* dentists. I have heard considerable talk about *institutional* advertising by dentists. In this type of advertising the emphasis is on an organization and an attempt is made to explain the purposes, objectives, and methods that the organization uses to promote the general welfare. It is not advertising by brand, by product, or by price. Most dentists and dental societies favor the principle of institutional advertising but they do not wish to have dues increased to meet the costs. The cost of such campaigns can be understood by this example. If each of the more than 80,000 members of the American Dental Association paid $1 extra a year in dues, the amount collected would buy four (4) full-page advertisements in *Life*.

If dentists really want improved public relations and public information they must face the reality that

the way is open
when
XYLOCAINE®
(brand of lidocaine*)
OINTMENT 5% ASTRA
is used for effective topical anesthesia
• To minimize the discomfort of new dentures
• In deep scaling or periodontia
• In transitory ulcerative lesions
• To mask the pain of needle penetration
• To alleviate postsurgical pain
*U. S. Patent No. 2,441,498

money is involved. They must be prepared to pay higher membership dues in their local, state, and national dental societies.

In addition to money and men in a public information campaign the subject of motive is involved. People are extremely conscious of motive. Two psychologists at Queen's College (Horowitz and Pastore) reported in *Science* a comprehensive study of how people change their ideas by subtle and unconscious methods. Whatever we hear, see, or read is filtered through some kind of judgment. It may be commendable or condemnable. Politicians lose elections, actors their audience, authors their readers, as a result of unfavorable judgments.

These two psychologists state these principles:

"1) The greater the esteem with which an author is held, the greater the tendency to attribute good motives to what he says, regardless of what he says.

"2) The more one agrees with a statement, the greater the tendency to attribute good motives to the author, regardless of who he is.

"3) The less the esteem with which an author is held, the greater the tendency to attribute bad motives to what he says, regardless of what he says.

"4) The more one disagrees with a statement, the greater the tendency to attribute bad motives to the author, regardless of who he is."

If we accept these psychologic principles we must be certain that in any public information program we write and show things that put dentistry in a praiseworthy light. We would not do that by telling the public how altruistic and dedicated dentists are. That approach of the invincible "men in white," the saviors of mankind, is trite and threadbare. *What interests people is themselves.* Any program of public information should tell people how *they* can be benefited in health, appearance, and pocketbook by dental care.

So far as I know, the slogan "Dental neglect costs more than treatment: in pain, in time, and in money" is a good starting place for any public information campaign.

—E. J. R.

All Added Rays Perilous

Any addition, however slight, to the world's natural background radiation presents a danger in terms of somatic effects and genetic changes, the United Nations Scientific Committee on the Effects of Atomic Radiation stated in its long-awaited report.

Specifically, these effects could include a rise in cancer and leukemia incidence, shortening of the life span, and in future generations impaired reproductive potential, fetal abnormalities, and diminished intelligence.

From *Medical News* **4**:26 (*Aug.* 25) 1958.

XYLOCAINE OINTMENT 5% ASTRA

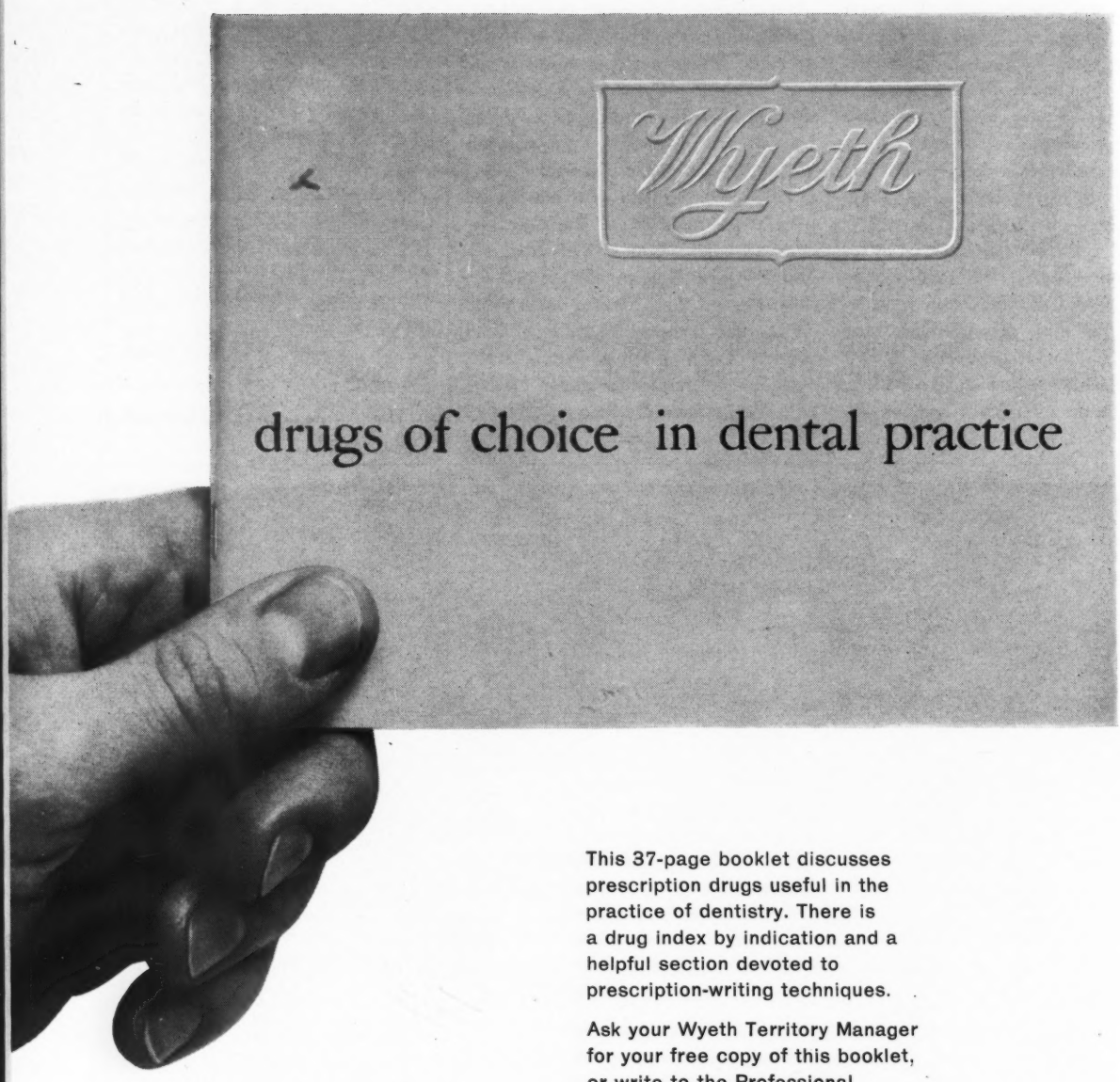
The rapid, powerful, and prolonged action of Xylocaine is available in a nonsensitizing, water-soluble ointment base to make this product an ideal topical anesthetic for use in the oral cavity.

Xylocaine Ointment (Astra) provides effective topical anesthesia in 3-5 minutes after application to previously dried oral mucosa.

Astra Pharmaceutical Products, Inc.
Worcester 6, Mass., U. S. A.

XYLOCAINE OINTMENT
for better doctor-patient relationship

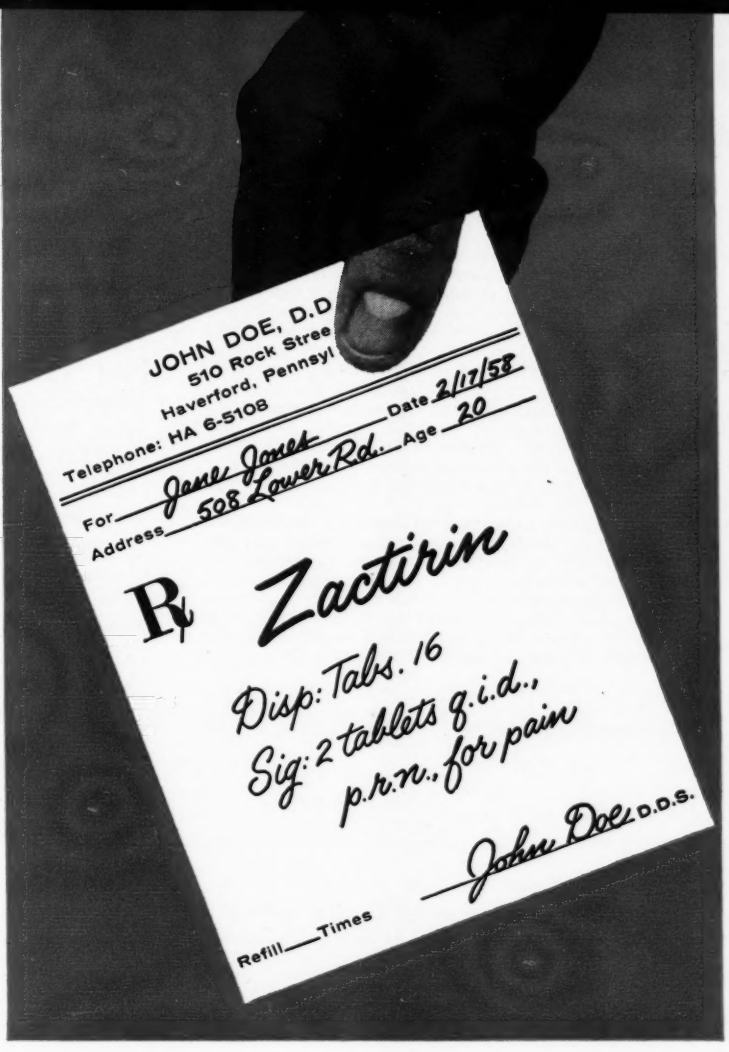
To help you
in your practice



This 37-page booklet discusses prescription drugs useful in the practice of dentistry. There is a drug index by indication and a helpful section devoted to prescription-writing techniques.

Ask your Wyeth Territory Manager for your free copy of this booklet, or write to the Professional Service Department, Wyeth, P. O. Box 8299, Philadelphia 1, Pa.

Another Wyeth Service to the Dentist



A non-narcotic analgesic as potent as codeine . . . without codeine's drawbacks

Two ZACTIRIN* tablets (Ethoheptazine Citrate with Acetylsalicylic Acid, Wyeth) are equivalent in analgesic potency to ½ grain of codeine plus 10 grains of acetylsalicylic acid.

ZACTIRIN is ideally suited for the office patient. It provides effective, well-tolerated, non-narcotic analgesia for moderate and moderately severe pain of dental origin.

For further information, see p. 23, Wyeth booklet, **Drugs of Choice in Dental Practice.**

*Trademark

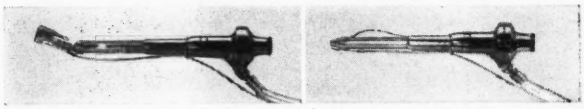
Wyeth®
Philadelphia 1, Pa.

New Dentalair Unit does all operative procedures with greatest patient comfort!

Eliminates need for belt-driven equipment!

Here's the new Dentalair Unit—the only high-speed unit that completely replaces belt-driven equipment! Two separate handpieces and finger-tip control of torque and turbine speed (0 to 175,000 rpm) let you perform every operative procedure with standard shank burs, discs, steels, stones, diamonds, and carbides. Prepare and polish amalgams and gold inlays; make porcelain jacket preparations and full crowns; grind and polish metals, acrylics, and porcelain teeth in bridges; even do prophylaxis—without resorting to your belt-driven equipment. All this, with full tactile perception.

What's more, your patient feels no vibration, hears no harsh whine or grating noises. And you cut down leg and back fatigue, thanks to the fingertip control. Result: You do more work faster and your patients are more comfortable—when you use Dentalair! Check the features described here, and then write for complete literature and the name of your nearest dealer. Address: Dept. DD-6.



Only high-speed unit with two handpieces and finger-tip control for complete versatility and less operator fatigue!

Dentalair offers every feature you want and need:

High speed—for rapid, efficient cutting with no perceptible vibration.

Air turbine—made by Atlas Copco, world's largest exclusive manufacturer of pneumatic equipment.

Automatic spray—fully adjustable for maximum cooling, or can be shut off completely.

Modern design—physically and esthetically attractive, with no complex belts and pulleys.

Quiet—no objectionable whine, buzz or grating noises.

Trouble-free—after 9 months' continuous use, a contra-angle handpiece required replacement of one $8.00 part.

Insured—five-year insurance policy guarantees 24-hour spare part availability.

Dentalair

610 Industrial Avenue
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Atlas Copco

930 Brittan Avenue
San Carlos, California

National Representative: Parkell Company, 23-06 31 Avenue, Long Island City 6, N.Y.

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Each holds a complete volume.

Price, $4.00, Postpaid

(Postage extra for shipment to other countries)

DENTAL DIGEST

1005 Liberty Ave.
Pittsburgh 22, Pa.

Smoking and Death Rates

E. CUYLER HAMMOND, Sc.D., and DANIEL HORN, Ph.D., New York

Summary

There is (1) a high degree of association between total death rates and cigarette smoking, (2) a far lower degree of association between total death rates and cigar smoking, and (3) a small degree of association between total death rates and pipe smoking. The available source of information for this study, on diseases involved, was cause of death as recorded on death certificates, supplemented by more detailed medical information in cases in which cancer was mentioned.

Specific Relationships Noted—The following relationships with cigarette smoking are evident: (1) an extremely high association for a few diseases, such as cancer of the lung, cancer of the larynx, cancer of the esophagus, and gastric ulcers, (2) a very high association for a few diseases, such as pneumonia and influenza, duodenal ulcer, aortic aneurysm, and cancer of the bladder, (3) a high association for a number of diseases, such as coronary artery disease, cirrhosis of the liver, and cancer of several sites, (4) a moderate association for cerebral vascular lesions, and (5) little or no association for a number of diseases.

Unassociated Disease—These include (1) chronic rheumatic fever, (2) hypertensive heart disease, (3) other hypertensive diseases, (4) nephritis and nephrosis, (5) diabetes, (6) leukemia, (7) cancer of the rectum, (8) cancer of the colon, and (9) cancer of the brain.

Relative Importance of the Association—This is dependent on the number of deaths attributed to each disease, as well as on their degrees of association with cigarette smoking.

Significant Factors

It was found that the death rate of men with lung cancer who had given up cigarette smoking for a

(Continued on page 513)

year or more before being enrolled in the study was lower than the death rate of men who were smoking cigarettes regularly at that time. An extremely high association between cigarette smoking and death rates for men with this disease was found in rural areas as well as in large cities. If smoking habits are taken into consideration, the lung cancer death rate was somewhat higher in cities than in rural areas.

Adapted from *Journal of the American Medical Association* **169**: 1308 (*March* 15) 1958.

Congenital Fossettes of the Lower Lip: Embryogenesis and Clinical Significance

FRANK W. PIRRUCCELLO, M.D.

An Anomaly

Congenital fistulae or fossettes of the lower lip were first described by Demarquay in 1845. Recent perusal of the literature has revealed that this is an infrequent congenital anomaly.

Description—The anomaly is characterized by two openings which appear on the vermillion portion of the lip close to the junction of the skin and mucous membrane. These openings are usually symmetrically placed approximately 1 centimeter from each other, giving a bilaterally symmetrical appearance. The orifices may be found as simple minute openings in the lip, or they may be found at the summit of nipple-like papillae raised up from the remainder of the lip appearing much like a double lip. These tracts run down through the substance of the lip, and end blindly in the orbicularis oris muscle.

Associated Abnormalities — These congenital fossettes are commonly found in families where cleft lip and palate are found. Often they are associated with cleft lip and palate or with congenital absence of teeth in the upper jaw. These fossettes may be found in several members of the same family, and it appears that they can be passed from generation to generation.

Related Factors—A series of approximately ten of these cases, some of which were examined at the Northwestern University Cleft Lip and Palate Institute, were studied. The various morphologic considerations as well as the embryogenesis of this condition were discussed. These congenital fossettes may be the only indicator of a potential cleft lip or palate subject in a family. The preponderance of these lesions is found in women patients in the Clinic.

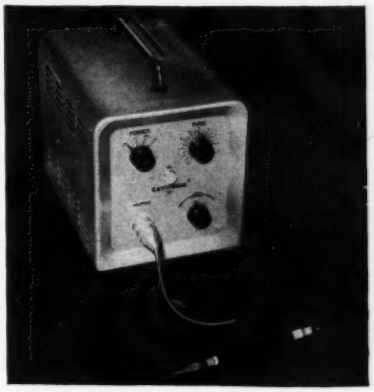
Adapted from *Proceedings of the Institute of Medicine of Chicago* **22**: 100 (*July* 15) 1955.

How To Remove Calculus And Stubborn Stain-Quickly, Gently

New Portable Prophylaxis Unit

● With this new Unit, even the most difficult prophylaxis and scaling procedures are completed in one sitting. Tiring, time-consuming hand instrumentation is eliminated, as are unpleasant scaling sensation, tissue laceration and postoperative sensitivity.

In fact, patients report eating dry toast without discomfort soon after extensive scaling procedures have been completed.



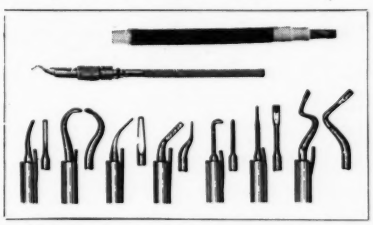
Portable Prophylaxis Unit—Cavitron "30"—only 9" wide, 10" high, 12" deep. Supplied with set of quick-snap-in tips.

Rapid Technique

In operation, the blunt instrument tip is guided lightly along the tooth from occlusal to gingival attachment. Ultra-rapid vibrations, so minute as to be unnoticeable, quickly dislodge all deposits, leaving velvety smooth crown and root surfaces. No abrasive is used.

Fingertip Control

Since no effort or pressure is required during the operation, the light handpiece can be precisely controlled. Vision is good, and quick-snap-in tips supplied with the Unit provide access to all areas.



Partial selection of quick-snap-in tips available with Unit.

Private Demonstration

Demonstration of the Unit in your office can be arranged through your local Cavitron dealer. Mail the coupon below—today.

CAVITRON EQUIPMENT CORP.
42-26 28th Street
Long Island City 1, N. Y. DD-11

☐ Yes—I would like to test the new Portable Prophylaxis Unit on my problem cases. Please arrange for a demonstration.
☐ Please send literature.

Dr. .....
Address .....
.....
Dealer .....

Help Fight TB

Buy Christmas Seals

See second cover D.D.11
UNIVERSAL DENTAL CO.
48TH AT BROWN STS., PHILADELPHIA 39, PA.
Please send Univac-Verident Dual-Dial Color Guide.

Dr. .....
Address .....
City .....

See page 465 D.D.11
E. R. SQUIBB & SONS
745 FIFTH AVE., NEW YORK, N. Y.
Please send Sumycin information.

Dr. .....
Address .....
City .....

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THE S. S. WHITE DENTAL MFG. CO.
PHILADELPHIA 5, PA.
Please send New Filling Porcelain Technique Book.

Dr. .....
Address .....
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See page 467 D.D.11
ELI LILLY & COMPANY
INDIANAPOLIS 6, INDIANA
Please send information on Valmid.

Dr. .....
Address .....
City .....

See pages 468, 471, 472 D.D.11
ASTRA PHARMACEUTICAL PRODUCTS, INC.
WORCESTER 6, MASS.
Please send information on Xylocaine HCL.

Dr. .....
Address .....
City .....

See page 469 D.D.11
AUSTENAL, INC.
5101 KEELER AVE., CHICAGO 32, ILL.
Please send name of nearest Vitallium laboratory.

Dr. .....
Address .....
City .....

See page 470 D.D.11
LEDERLE LABORATORIES
PEARL RIVER, N. Y.
Please send free prescription pads.

Dr. .....
Address .....
City .....

See page 473 D.D.11
INTERSTATE DENTAL CO., INC.
220 WEST 42ND STREET, NEW YORK 36, N. Y.
Please send combination offer of Jelset Impression Powder mentioned in ad.

Dr. .....
Address .....
City .....
Dealer .....

See page 474 D.D.11
PETER, STRONG & CO., INC.
207 E. 37TH ST., NEW YORK 16, N. Y.
Please send further information about Profie prophylaxis materials.

Dr. .....
Address .....
City .....

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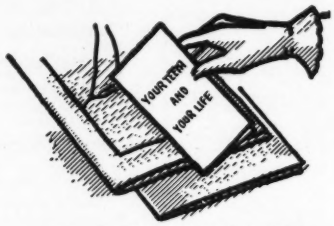

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Ask yourself, DOES IT STILL HAVE AN ACID LIQUID AND AN ACID EFFECT ON THE PULP AND REQUIRE A LINER? If it does, it is the same old thing.

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MER-DON 7 is a fiber reinforced mineral plastic, not a resin.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS, OF AUGUST 24, 1912.

Of Dental Digest, published monthly at Pittsburgh, Pa. for October 1, 1958.

State of Pennsylvania,
County of Allegheny,

ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared R. C. Ketterer, who, having been duly sworn according to law, deposes and says that he is the Vice President of the Dental Digest, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the name and addresses of the publisher and editor, are: Editor, E. J. Ryan, B.S., D.D.S., 708 Church Street, Evanston, Ill.; Publisher, M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa.; Managing Editor: None; Business Manager, R. C. Ketterer, 1005 Liberty Ave., Pittsburgh, Pa.

2. That the owners are: Dental Digest, Inc., 1005 Liberty Ave., Pittsburgh, Pa.; Oral Hygiene, Inc., 1005 Liberty Ave., Pittsburgh, Pa.; M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa.; Lynn A. Smith, 1005 Liberty Ave., Pittsburgh, Pa.; R. C. Ketterer, 1005 Liberty Ave., Pittsburgh, Pa.

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(Signed) R. C. KETTERER,
Vice President

Sworn to and subscribed before me this 23rd day of September, 1958.

(Seal) N. M. Gaertner, Notary Public.

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